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MISCELLANEOUS.

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BEFORE THE

ROYAL GEOGRAPHICAL SOCIETY.

I.—*An Account of the Route and Appearances of the Country through which the Arctic Land Expedition passed, from Great Slave Lake to the Polar Sea.* Communicated by Captain Back, R.N. Read 23rd November, 1835.

It will be remembered that in December, 1831, about two months previous to the departure of the expedition so generously promoted by his Majesty's Government and the public to afford relief to Captain Ross and his long-absent companions, a paper was communicated by me, afterwards inserted in the Journal of the Society, descriptive of the usual canoe route as far as the Hudson's Bay Company's establishment at Great Slave Lake, in latitude 61° 10′ 26″ N., longitude 113° 45′ 0″ W., and of the course intended to be pursued afterwards, for the further attainment of the interesting object of my mission. In the following statement I give the result of my observations, after leaving Fort Resolution, in the prosecution of my journey.

On quitting the Fort we went through some of the winding channels formed by the numerous islands in the delta of Slave River; and, having passed Stony Island, which, as Dr. Richardson remarks in the Appendix to Franklin's First Journey, "is a naked mass of red granite, fifty or sixty feet high, precipitous on the north side, and lying near the junction of the flat limestone strata with the primitive rocks," we kept along the low and swampy south shore, thickly matted with drift-wood; and made for a jutting elevation called Rocky Point, whence the lake trends to the eastward, receiving three rivers within a distance of forty miles, viz., the Telh-tcha-ho-desseh, the Thu-wu-desseh, and the Yea-na-desseh, or Wolf River, all of which are frequented by the Chipewyans, who report that near the last, the shore, still low, inclines to the north, and is indented into bays, which are entered by three more streams of an inferior size. It then rather suddenly rounds to the westward, and terminates in a narrow neck of land called Point Keith. It does not appear, by the many accounts procured from the Indians, that the lake extends to the eastward at this part beyond the 112th degree of longitude.

From Rocky Point, the last place within the knowledge of the voyageurs, we struck off in a northerly direction towards a distant cluster of islands, which, owing to the refraction of the atmosphere, appeared to be poised in the sky.

The traverse here is dangerous, from the frequent storms to which it is exposed, and is greatly dreaded by the Indians, who, in attempting to cross in their small canoes, are sometimes surprised midway and thrown into the most perilous situation. To the members of the expedition it is associated with another melancholy reflection, for it formed the death-spot of poor Augustus, our Esquimaux interpreter, who, in his zeal to join our party, lost the path, and worn down by privation, was overwhelmed in a snow-storm while endeavouring to retrace his steps across the ice to Fort Resolution. The islands are mostly granitic, the rocks being either of a grey colour, with plates of mica, or consist of red felspar and quartz. The more southerly islands are partially wooded by small clumps of dwarf pines, and produce whortleberries, cranberries, and crowberries. Birch was seen on others; but many were totally destitute of herbage, and presented a round and barren aspect, contrasting strongly with the shelving and precipitous sides of those that support pine trees. Farther to the north the rocks attain a greater elevation, being generally from 200 to 1000 feet high, resembling the bluff and broken features of those to the westward, near the Gros Cap of Mackenzie, but still more like the red granite hills in the neighbourhood of Fort Chipewyan and upper part of the Slave River. They are very dissimilar to the low, swampy, limestone tracts that we had left, and are almost totally destitute of the drift timber which is piled in such immense quantities about Fort Resolution and on the more western shores of the lake. The clear green north-eastern waters also contrast strongly with the turbid yellow streams of the Slave Lake, hurrying towards the Mackenzie. Conical isolated hills are in various places separated by narrow passages from the larger islands, and their truly picturesque outlines, rent into vast chasms and craggy fissures, and rising upwards of 1200 feet, were as imposing as they were novel and unexpected. It is near to this that Point Keith, jutting from the southern main, describes the deep bay already mentioned. The islands thence stretch to the westward, and under the appellation of Simpson's Group, cover a space of thirty-two miles from north to south, and forty from east to west. The fish called by the traders the 'inconnu,' or *Salmo Mackenzii* of Richardson, is caught amongst them, but does not go farther south than the rapids in Slave River. The land extends from Point Keith almost due east upwards of seventy-five miles, and is designated on the chart Christie's Bay. Four islands, with perpendicular

sides, are visible in that direction, leaving a clear horizon beyond them; but the south shore, according to the testimony of the Indians, is bent into bays that receive two large rivers, named the White Sand River and the Teh-zu-desseh,* which latter is said to take its rise near the Fond du Lac of the Athabasca, though it is joined by another branch, the particulars of whose course, farther than is marked on the chart, I could not learn; a circumstance the more difficult to account for, since the country around it is the favourite hunting-ground of many of the Chipewyans.

The channel between Point Keith and the northern shore of the lake is interrupted by Etthen-nueh, or Rein-deer Island, remarkable for its table-land with perpendicular cliffs, resting on sloping and irregular declivities that gradually descend to the water's edge, and are thickly covered with low wood. A point that forms the western extreme of a small bay was so diversified in its formation as to induce us to land to examine it. Either from the grinding pressure of the ponderous masses of ice that are here heaped up, or from the incessant action of breaking waves, the whole line of shore, for two or three miles, is composed of a kind of pudding-stone, consisting of fragments, all more or less globular, cemented by a yellowish clay of considerable tenacity, and which, becoming indurated, has united them into a substance as durable as rock. The height of this kind of beach to its junction with the adjacent rocks, is from six to forty feet; while these, acquiring elevation as they recede, soon attain the altitude of from 1400 to 2000 feet, contrasting widely in their ruggedness with the flowing outline of the western main shore, which is seen from hence to the extent of about fifteen miles. To the right, and within three miles of the main, is Peth-the-nueh, or Owl Island, which, at the end of sixty-two miles, forms with its opposite high land the narrow opening into Christie's Bay. The point next rounded is steep and perpendicular, and is often resorted to by the Indians, for the purpose of obtaining a variegated marl of a greenish grey colour, with which they make their calumêts and pipes. A similar substance of a reddish tint, as well as one of a pure white, both admitting of a high polish, is also found beyond the eastern limits of the lake. Proceeding to the north and east, Peth-the-nueh has altogether an imposing appearance, owing to its trap formation, which exhibits long lines of mural precipices, rising one above another, and capped by even and round eminences thinly clad with meagre pines. It was impossible to look at these without being forcibly reminded of the same appearance, but without trees, observable between the Coppermine

* The Zaut-desseh is the Yellow Knife River, and gives name to the Copper Indians, who are said to have emigrated from its banks to the Coppermine River.

River and Point Barrow, which, says Dr. Richardson, 'is exceedingly sterile, one cliff rising above another with stony valleys between, almost destitute of herbage. The predominant rocks are liver-brown clink-stone porphyry, with a few beds of earthy-green stone. The same formation extends to the mouth of Wentzels River, the trap cliffs succeeding each other with tiresome uniformity, and their debris entirely covering the narrow valleys that intervene, to the exclusion of all vegetation.' The islands to seaward of Point Barrow, on the west, are also amygdaloidal, or nearly of the same material; and this formation would thus seem to run in a line almost due south to Great Slave Lake, where it becomes amalgamated, or lost in the granite district, occupying an extensive range to, and beyond, Fort Chipewyan. The main shore of the lake is also mountainous and rocky, but consists chiefly of gneiss and porphyry; and at a contracted part of the channel, called Tal-thel-leh, the water is said never to freeze, a fact not attributable to any particular strength of current, which indeed was not more than perceptible, but which during two winters was found to be correctly reported, though from what cause could not be ascertained. It was close by this that an island was seen displaying a barren and round outline to the north, but broken into a columnar or basaltic form to the south. The altitude of the shore varies only in a trifling degree, until the 'mountain' (so distinguished by the Chipewyans) attracts the attention. This has not, however, any great advantage over the neighbouring land, more than as the chosen place where they leave their canoes when striking into the interior. From it is seen the bold and picturesque land of Gah-hooa-tchel-la, or Rabbit Point, more than 2000 feet high, almost perpendicular, and evidently a part of the same formation, or a continuation of Peth-the-nueh, from which it is separated to the south and west by the opening leading into Christie's Bay.

Both shores of the lake begin now to approximate, preserving however their distinct characters; that to the north being round-backed and grey, with a few trees; that to the south precipitous, cliffy, and almost barren. A passage three-quarters of a mile in width extends from M'Leod's Bay to another nearly land-locked bay; and at its northern termination was the selected spot of our winter quarters, Fort Reliance, in latitude 62° 46′ 29″ N., and longitude 109° 0′ 39″ W. It was preferred, not only from being the eastern extremity of Great Slave Lake, but also because it was represented to abound in animals and fish, and calculated, accordingly, to support a large party; which character was verified for a limited period; but early after the setting in of the frost both supplies failed, the animals going far away, and the fish merely frequenting this part during the time of spawning, most likely from the absence of the trout and pike found in great

numbers farther west, where the water, discoloured by the muddy deposits from the Slave River, is less clear, and possibly more favourable for their depredations. On several occasions the spawn of the white fish was found in the intestines of the trout.

The rocks inclosing this part are like those already noticed, but more acclivitous, with some trees of a stunted growth, but little other vegetation beyond moss. Many attain a considerable altitude, rising successively in rounded forms, so smooth and steep as scarcely to admit of a resting-place for the winter's snow. The small, though deep, intervening valleys are generally swampy, and produce a coarse, long grass, or are choked up with moss-covered debris, or large fragments of rocks. The sandy plain on which the house was erected is about three miles broad, and hemmed in east and west by two rivers, which run along the bases of parallel ranges of granitic hills, varying in height, but alike barren and difficult of access. This plain is comparatively level, and within the space of half-a-mile ten other similar platforms with embankments gradually rise towards the uneven and rocky valleys which lead to the barren lands. It seems as though the water of Great Slave Lake had once been so high as to have had the upper of these embankments for its boundary, and had since subsided to its present level;—an idea in some measure countenanced by the encroachment of Lake Winnipeg on its northern banks, which, connected with other reasons, lately induced the Hudson's Bay Company to change the situation of their establishment to a more firm and eligible spot. Immediately north of the Fort, including the space between Hoar-frost and Ah-hel-desseh rivers, which is from twenty-two to thirty-four miles in breadth, the country is mountainous, consisting, for the greater part, of a coarse granite, in which red felspar and large plates of mica are conspicuous, traversed occasionally by veins of very white quartz. The ascent towards the barren lands may be taken at 1400 feet; and at one point, not more than fifteen miles from the house, the Indians reported that at all seasons, summer and winter, a high and dense column of smoke was seen to issue from a deep cavern, which had never been examined by any of their tribe, who rather conjectured it to be the abode of some 'manito,' or evil spirit, and therefore could not be induced to approach too near, lest such intrusion might rouse its anger, and misfortune should befall them. Aware how liable these people are to exaggerate any unusual appearance to which the aid of superstition has been added by their forefathers, I at first paid little attention to this narration; but when two men of the expedition, remarkable for acuteness of observation, verified it, as far as they could judge from a distance, I thought it necessary to visit the spot, when the smoke alluded to was discovered to be

caused by a noble fall, which hurled its foaming waters into a chasm 400 feet deep, and sent up the vapoury column that had deceived so many. It was March when I visited it, and the falling spray had frozen against the high and perpendicular face of the rocks, to which overhanging masses of ice, of a bright green and pale blue colour, with pendant icicles, gave the semblance of an iceberg.

We ascended the 1400 feet above mentioned, by means of carrying our canoe over craggy and difficult portages,—a task rendered infinitely painful by the incessant attacks of myriads of mosquitos and sand-flies. We also stemmed the rapid current of the Hoar-frost River, amidst high and beetling rocks, whose grey and time-worn outline often represented (without the aid of imagination) some ruined and turreted castle. Proceeding to the north, along Artillery Lake, the country assumed a more open aspect, with sloping moss-covered hills, on which clumps of wood, far and wide between, seldom topping the summits, but often found in the valleys, indicated the decrease of vegetation of the larger kind; and in latitude 63° 15 N., the pine, after dwindling down from the height of six feet to eighteen inches, disappeared altogether.

It was here then that the barren lands fairly commenced; and at no great distance to the eastward we found a long, narrow lake, which, according to the testimony of the Indians, is devoid of current; but after trending to the north-east, it was said to be joined by the waters of a smaller lake, and then, taking a more easterly direction, to be connected by means of a rapid with another singularly-shaped lake, from which it ultimately empties itself by a contracted stream into the broad and gently-flowing The-lew-desseh—a river of magnificent dimensions by all accounts, and which, from its easterly course, I think, probably falls into Chesterfield Inlet. The natives affirm, indeed, that its source is not far from the north end of Athabasca Lake, and that they resort to its banks for the double purpose of hunting and procuring birch, of the bark of which they construct canoes; but as this latter material is extremely scarce, even round the south and west shores of Great Slave Lake, and becomes more rugged, and therefore less adapted for use as it approaches the Arctic Sea, there does not seem much probability of the The-lew-desseh's stretching far in that direction; and this opinion exactly coincides with the statement of the 'Camarade de Mandeville,' a Chipewyan chief, who described it as always gaining to the right hand when he was looking towards the north. Until this came to my knowledge, I rather imagined it to be identical with Baillie's River, which joins the Thlew-ee-choh, in longitude 104° 18′ W.; but the facts thus stated, together with the Indians having seen the The-lew-desseh actually beyond the point

of junction of these two rivers, lead rather to the inference that its course must carry it near the inlet alluded to. Hearne must have crossed it in his journey to the Coppermine with Matonnabbee; and it is doubtless the Thele-aza river of his map.

Resuming the track of the Expedition, Artillery Lake, the name given to the first of the above lakes, is connected with Clinton-Colden Lake by a short but rapid stream; and the latter lake is next joined to Lake Aylmer by a narrow strait, in which the current runs from west to east. The surrounding country is characterized by the low altitude of the hills, which are more or less covered with large boulders, and decline to the water's edge.

Islands are numerous in all these lakes, many of them consisting solely of one immense rock, whose grey surface is not unpleasingly varied by lichens and a scanty growth of rein-deer moss. Their summits were usually crowned by huge stones or splintered fragments of the same substance, either standing upright or in slanting positions, which produced a bold effect when illuminated by the bright rays of the setting sun. Sand was at first seen along the beach, but it soon rose into banks and mounds; and finally, at the northern extreme of Lake Aylmer, hills of some magnitude, and dipping to the north-west, indicate the height of land that feeds Sussex Lake, the source of the Thlew-ee-choh-dezeth. It is a small lake, encompassed by low, shelving declivities, thickly studded with stones and rocks, whose intervening spaces are filled up with green moss, dwarf birch, and other small shrubs. In the centre of the lake stands a rocky island, and to the west a low ridge of sand-hills, which terminates abruptly, and leaves a free passage for the egress of the water to the north.

Within a mile of this, there is a slight descent, forming a shallow rapid, distant only three-quarters of a mile from Lake Aylmer, which may be considered three feet lower than the highest part of the dividing land. About half way between the two there is a large pond, with a few shrubs and willows near its margin. The Thlew-ee-choh winds its way through sand-hills (which, as previously noticed, dip north-west), and passes the first rocks of gneiss *in situ* about four miles down the stream. They have an even or tabular surface, and are broken into perpendicular cliffs about five feet high, which face to the east. Several rapids immediately succeed, and two rivers (one of which finds its way under a canopy of ice) contribute their waters from the east and west.

Having passed a circular piece of water, called Musk Ox Lake, from the number of those animals seen on its banks, the Thlew-ee-choh is joined by a large river, said by the Indians to come from Contwoy-to Lake, passed by Hearne in 1771, and more recently by Sir John Franklin in 1821. If this be the case,

as they all positively affirmed, that lake must have two outlets* almost opposite and far removed from each other—a circumstance, considering the mountainous nature of the ground, rather improbable. But as two other lakes were said to intervene between it and our position, there seems a great likelihood that it may owe its origin to one of these; at least such an inference would be more in accordance with the general features of the country.

The Thlew-ee-choh next cuts its way transversely through a mountain range running east and west, and then becomes very much interrupted by rapids, the force of which is greatly augmented by the contribution of tributaries from either side. Sand-banks also begin again to appear, and hills of a few hundred feet, with long sloping declivities partially covered with the usual fragments, form the leading characteristics. At length, in latitude 65° 40′ N., and longitude 106° 35′ W., within sixty miles of the southern extremity of Bathurst's Inlet, a barrier of mountains turns it away to the east, and thus were destroyed the hopes, up to that time entertained, of our getting to the Polar Sea in that direction.

The rocks along the lake which next opened to us are extremely rugged and desolate, and in many places bear a close resemblance to the lava round Vesuvius. The small prairies between the rocks afford pasturage for rein-deer, which were seen in vast numbers. Some cascades, a mile and a half long, with sixty feet descent, terminate the lake; and then the river, with an increased current, follows the windings of a line of sand-hills, generally of a conical shape, and partly covered with grass. Three isolated mountains of gneiss were here also seen, and opposite to them were found some old marks, evidently made by the Esquimaux, probably from Chesterfield Inlet, who might have easily come by a magnificent river, which joins the Thlew-ee-choh from the south a few miles lower down, almost in a line with the inlet.

The country beyond this is low, flat, and very sandy, with an occasional smooth hill rent into water-courses; and here and there, at intervals not exceeding half a mile from each other, the obtuse and rounded tops of a few dark rocks peep above and chequer the surface of the yellow sand. Afterwards a mass of rocks occurs between which the current runs with extreme force. Beyond, several rivers join from both sides, and the main one expands into an extensive lake, with clear horizons at different points of the compass, where, as late as the 20th of July, the ice had not begun to break up. Many islands are here found, and the ridges and cones of sand of which they are composed are not only of considerable height, but are most singularly and remarkably crowned

* Congecatha-wa-chaga River is an outlet of Contwoy-to Lake.

with immense boulders, grey with lichen, which we would most assuredly have considered to have been set up by design had not the total impossibility of moving such enormous masses, from we knew not where, proved that they were the work of nature.

A succession of dangerous falls and rapids next took us to the south-east, until at length, in latitude 65° 54′ 18″ N., longitude 98° 10′ 7″ W., the river burst with fury between four *granitic* mountains, which, like immense flood-gates, diverted its course, and made it flow tolerably directly towards the north. Before this it seemed uncertain where it might terminate, this position not being far from the heads both of Wager Bay and Chesterfield Inlet.

The stream now became from half a mile to a mile wide, with a current of whirlpools and rapids of the most fearful description; and the adjoining country was far more rugged and mountainous than before. Indeed, it was not until this stage that rocks had been observed to the eastward of us at all. Having passed through another lake much impeded by ice, the river next turned towards the east, and led to a steep fall, where many Esquimaux were employed fishing. On the first alarm, the men assembled, armed with spears, slings, and knives, and manifested a hostile disposition; but subsequently they became pacified, and assisted in carrying the boat across a portage, which without their aid we should have had much difficulty in passing. These people were ignorant that any ship had been to the north, and testified their surprise at beholding Europeans, whom till that moment they had never seen. They described the sea as being near, and the coast as trending westerly towards Point Turnagain, and easterly towards Prince Regent's Inlet. To make the latter more clear, one of their number, who seemed the most intelligent, drew the coast line from our position towards the north, and making a direct turn to the eastward, led it away to the south of where we then stood; at which part he said, with considerable emphasis, there was no more sea, but plenty of musk oxen. This he repeated twice, and remarked that his countrymen always took that route in their canoes to a place called 'Ak-koo-lee,' which, according to Sir E. Parry, is a part of the shore of Regent's Inlet, somewhere to the southward and westward of Fury and Hecla Strait.

The sea was found in latitude 67° 7′ 31″ N., longitude 94° 39′ 45″ W.; and the mouth of the river was much embarrassed with shoals and sand-banks, while the view to the north was partly terminated by a lofty headland connected with the eastern range of mountains, which, after extending about forty-four miles to the north, ends abruptly in a high bluff, and goes away to the south-east, corresponding in that respect with the account given by the natives.

The western coast rounds off at once from ten to twenty miles from its opposite one, and is indented into deep bays or openings, whose general line of direction appeared to trend a little westerly. In this manner it continues to latitude 68° 13′ 57″ N., longitude 94° 58′ 1″ W., where it turns off to the west, the range of mountains in that direction suddenly terminating, and obviously trending towards Point Turnagain ;—obviously, I say, because they were not so remote from us but that their prolongation would have been visible had they merely rounded into a bay and then resumed their northern direction. There was also a clear icy horizon beyond the extreme point, with a strong current from the westward, which had brought some drift wood of the white pine species, known to be the growth of the Mackenzie River, so little sodden as to burn immediately it was ignited, which it would not have done if it had been long exposed to the action of the water. The vertebræ of a whale were also found near the same place. Due north were two blue objects, named on the chart Point Booth and Point James Ross, which seemed to be islands. In the north-east were water and ice, with what is denominated a water sky beyond. In the east the sea was perfectly clear, with one small island bearing E.b.S. from fifteen to twenty miles distant; and to the right of this was also a wide, open space of water before coming to the eastern land. The progress of the expedition was arrested solely by comparatively small drift ice, packed, by a continuation of heavy gales, against the western shore. To the east there was no obstacle of any description to prevent our sailing to wherever the open water might there lead, which, according to the authority already stated, is to Ak-koo-lee. The character of the obstructions to the west was also such as almost to prove that they were only fluctuating and occasional; and my impression therefore is, that further attempts at discovery may be here made with good prospect of success. A vessel detached to Repulse Bay, or Wager Inlet, with the means of transporting boats and stores across the intervening land to Ak-koo-lee, would, in my opinion, in one, or at most two seasons, complete the geographical delineation of this part of the American coast,—the only portion, it may be added, remaining, regarding the configuration of which any reasonable doubt can be still entertained.

The chief results of my late expedition, then, have been the determination of the physical aspect of the country north-east of Great Slave Lake, which was previously an entire blank in our maps, and the contribution of some additional facts regarding its coast-line. Of these facts the most important are the discovery of an open sea, nearly ninety miles south of Boothia, with a current flowing into it from the westward, making it probable that an open passage exists here from east to west. That this current, also, is

the same which has been observed at so many other points, from Behring's Straits to Point Turnagain, I have myself no doubt, being persuaded of this chiefly by the drift-wood, evidently proceeding from the Mackenzie, which I found on this shore. But as the Society, in the present paper, looks to me, I am persuaded, rather for facts than reasoning, I forbear from entering on the wide field of speculation which the subject affords.

The Esquimaux whom we met near this part of the coast differed but little from those I had previously seen. They were somewhat more regularly and liberally tatooed than the people near the Mackenzie; and the beards of the men were more ample, not unaccompanied in some cases with a degree of baldness, which by apparently enlarging the forehead improved the physiognomy. The loss of poor Augustus, however, deprived us of an interpreter; and our intercourse with them was consequently brief and unsatisfactory, marked on our side by a show of confidence which we did not altogether feel, and on theirs by a distrust which they were at little pains to conceal.

II.—*Account of the Rivers Amazon and Negro, from recent Observations.* Communicated by Lieutenant Smyth, R. N. Read 14th December, 1835.

The general course of the Marañon, or River Amazon, is tolerably well laid down in our modern maps; but the situations assigned to the towns on the upper part of it want correction, towards which I hope I have some means of contributing, from observations made in the course of a recent journey from Lima to Para, which was undertaken with the hope of ascertaining that, from the port of Mayro, on the Pachtea, that river might be found navigable to its junction with the Ucayali,—and that, by means of the latter and the Marañon, or River Amazon, a good communication might be found to exist between Peru and the Atlantic Ocean. A new and increased interest would thus be given to the greatest river in the world, which receives into its bed near twenty tributary streams, each of which is also a mighty river. The object of this journey, it is true, was not attained, for reasons which will be laid before the public; but it is not necessary here to detail them; suffice it merely to say, that we were unable to accomplish the land journey to Mayro.

The general error of the maps is in assigning to the rivers Huallaga and Ucayali, and to all the towns on the upper part of the Marañon, a position too far to the eastward, in some instances even exceeding a degree; for the astronomical observations that we made came in all cases so near to our dead reckoning, that I

cannot help flattering myself that in the positions we have laid down we have been tolerably accurate.

The course of our navigation was down the Huallaga from Casapi, which is about forty miles from Huanuco, to the mouth of the Chipurana; up that stream and the Yanayacu as high as canoes could go; then across the intervening part of the Pampa del Sacramento to Santa Catalina; and down the stream which bears that name to the Ucayali, a little below Sarayacu. After spending some time at the latter place, we proceeded down the Ucayali into the Marañon, and by the latter to Para.

The main stream, from its source as far as Tabatinga, on the frontier of the Brazilian territory, is called the Marañon; thence to the mouth of the Rio Negro, it has the name of Solimoes or Solimao; and from the Rio Negro to its mouth it is called the Amazona. The rate of the current we found pretty uniform throughout its whole course, being about three and a half miles in an hour. Our journey was, however, made during the rainy season, when the river was high, and in many places had overflowed its banks into the interminable forest by which it is bordered. We understood that in the dry season it is less rapid. We observed that the wind was always in a direction exactly contrary to that of the stream, notwithstanding its windings; and the same was the case on the Ucayali and Huallaga. We were told also that when the Marañon is at its lowest, the wind is stronger than when the water is high. The only exception to this contrariety of wind and stream is when one of those hurricane squalls come on which are so frequent in January, February, and March, on this river, and which we then experienced almost daily; they are always attended with thunder and lightning, and come from all quarters with an appalling fury. They last, however, but a short time, and as soon as their rage is spent, the wind resumes its wonted course.

The rising of the Marañon seems to be entirely caused by the rains, which produce a difference in its level in some parts of full forty feet, as we ascertained at Egas, a few leagues above the mouth of the Teffe, by sounding at a point where we were assured the dry land appeared when the stream was low. The error in the latest and best map I had seen, when on the river, that published by Mr. J. Arrowsmith in 1832, is greatest at the most westerly point on the Marañon at which we had an opportunity of taking an observation, viz., near Nauta, which is placed one degree and nine miles too far east; thence the positions of all the towns are from half a degree to a degree too much east, till we reached Coari, where, according to my calculation, the map was right; and thence to Barra the error is the other way, for I place this town forty-four miles farther east than its position as given in the map, as may be seen from the following table:—

	Position according to our Calculation.		Position according to the Map.	
Nauta	Lat. 4° 29′ S.,	Long. 73° 57′ W.	Lat. 4° 27′ S.,	Long. 72° 48′ W.
Loreto	3 46	70 37	3 52	69 50
Tabatinga	4 19	70 17	4 15	69 24
San Pablo	3 26	69 10	3 40	68 40
River Jutay	2 43	67 8	2 40	66 40
Fonteboa	2 30	65 24	2 35	66 15
R. Jurua	2 33	65	2 40	65 40
Ega	3 18	64	3 18	65
Coari	4 1	62 45	3 55	62 50
Barra	3 8	59 16	3 10	60

We endeavoured to collect during our passage down the Marañon all the information that we could respecting the course and qualities of the several great streams whose waters are absorbed by this immense river; but our opportunities were not so numerous as could be wished of procuring accounts that could be relied on. I satisfied myself, however, from a great deal of conversation with Padre Plaza, the missionary priest at Sarayacu, who has lived there upwards of thirty years, and several times navigated high up the Ucayali, that the Beni does not fall into that river, as it is represented to do in the map above alluded to. Padre Plaza was of opinion, from the accounts he had obtained from the Indians, that the Yavari was in reality the lower part of the Beni; but I also satisfied myself, from an intelligent Portuguese resident at San Pablo, who had been up the Yavari, that this could not be the case: for at no great distance from its mouth the Yavari was said by him to divide into several small streams, and to be no farther navigable, my informant having himself ascended it to this point.

At Egas, on the Teffe, I learnt that that river, which makes a considerable figure on the maps, was not navigable for more than a day's journey from that town. This information was furnished by several Indians who worked in the cocoa plantations on the banks of the river.

Of the Purus we could get no other intelligence, than that it was a very great river, which four great mouths by which it rolls its waters into the Marañon sufficiently prove: the largest of them is nearly a mile and a half broad, and we could get no bottom with a line of twenty fathoms.

Had not all the recently published accounts of the Beni made that river fall into the Madeira, I should have been inclined to surmise its being the same with the Purus: at all events of the unexplored streams that fall into the Marañon, this appears to me to be by far the most deserving of attention, and to be that which affords the most promising prospect of a communication with Bolivia.

The Tapajos, which falls into the Amazon at Santarem, is regularly navigated to the foot of the Sierra Pary, or *Diamantino*,

from which the river Preto flows into it; and from the point where the Preto ceases to be navigable, to that on the other side of the Sierra, where the Cuyaba is navigated, is a distance of only eighteen miles,—the latter falling into the Paraguay, so that, with this short interval, there is a communication by water from the Amazon to the river Plate. The benefits that might be derived to the countries lying on either side of the Marañon by the establishment of steam navigation upon that river are beyond all calculation; for no country upon the face of the globe affords such access by water, to almost all parts of it, as the immense tracts which lie on both sides of the Marañon, of which my own observation has satisfied me. The river itself, to the mouth of the Ucayali, and the latter as high as Sarayacu, are navigable for vessels of large draught.

While I was at Barra I had an opportunity of procuring a manuscript account of the country, more particularly that in the neighbourhood of the Rio Negro, composed by Padre André Fernandes de Sousa, a Portuguese priest, who resided for many years at Barra, and travelled a great deal in the country; his character, I found, stood very high as an intelligent and able man. The manuscript seems to have been intended either to be presented to the Emperor of Brazil, or to have been published and dedicated to him. The narrator supposes himself to be ascending the river, and one of his chief objects appears to have been to represent to his Majesty the oppression of the Indians by the Portuguese governors, and the injury which the country sustained from it. The following is a translation of what it contains respecting the geography of the Rio Negro:—

"The breadth of this river at the mouth is not great. Leaving the Solimão on the left, the Rio Negro is entered on the right in 3° 9′ S. latitude, with a direction from the east to the west almost parallel with the Solimão. At its entrance it is scarcely a mile and half broad, but after ascending a distance of ten or twelve leagues, it increases to near nine miles; this breadth being chiefly where the islands called Anavilhanas begin. Its waters are dark; and its banks a dry soil, on which there are many farms and profitable establishments. Two leagues from its entrance is the town called Barra do Rio Negro, formerly belonging to the parish of Serpa, but since the removal of the archives by the Governor Gama from Barcellos, it has become the chief town on the Rio Negro. It is situated on the north bank on high ground, but can never become a very populous town, because the land is broken and hilly, and when the river is full is much divided by water; nevertheless, it has many buildings, and among them twenty or more, including the imperial edifices, covered with tiles. The church, which is small for the population, which exceeds 8000, is

named the Mystery of the Immaculate Conception of our Lady. The inhabitants live by cultivating tobacco, making turtle oil, salting fish, and growing coffee, cocoa, and other plants. A league above Barra, on the north bank, is the small river Taroma. At its mouth is the plantation of the Ex-Governor José Joachim Victorio, in forming which he removed all the population, and obliged 400 or 500 Indians, of both sexes, to work on it with no other payment than a very slender subsistence, which was a principal cause of the desertion of the Indians, and the ruin of commerce and agriculture for ten years;—of agriculture, because the people were obliged to abandon their plantations, and of commerce, because the canoes, deprived of their crews, remained stationary for months together in the port of Barra, sinking with their cargoes on board, as literally happened to one belonging to Don John Custodia, an inhabitant of Olivença.

"Eleven leagues above Taromá are the islands which are called Anavilhanas, derived from the name of the river Anaviana, which is on the north shore of the Negro, and by the corruption of the word called Anavilhanas, which means a confusion of islands. Among these, in a north-west direction, is the main channel, on which, having ascended fifteen leagues, is a place called the Ponta de Pedras, (or rocky point,) called by the natives Igrejinhas, situated four miles short of Airão. The rocks here form corridors and chambers; the roof is of broad and flat freestone, and the bottom is white sand. When the river is high, all is under water; but when low, the view is very pretty.

"Airão is situated on the south side of the river, on good ground; its population amounts to about 500. The buildings are chiefly thatched, as is the church, called San Elias. The sacred ornaments are in good condition, although they are old. The residence of the priest is at Barra. The inhabitants gain a livelihood by growing and cultivating coffee and other plants. In 1795 this place was attacked by the infidel Indians called Aruajuis, who inhabit the rivers on the frontier, when they surprised and killed two white men. The government sent a force to punish these Indians; but it was unable to find them, as they secreted themselves in the forests.

"On the north bank, and opposite Airao, are the mouths of the rivers Aiurím Canumaú and Mapenuaú. Their waters are dark-coloured, and their banks are inhabited by the above tribe, called Aruajuis. The countries on these rivers abound in wax, pao-cravo, or nail-wood, and plenty of fine-grained wood for building. Twelve leagues above Airao is the town of Moira, on the south bank; it is situated near a large stone quarry formerly called Pedreira. It is one of the best towns on the Rio Negro. The church and some of the houses are covered with tiles; the former

bears the title of Santa Ritta. This place is inhabited by many white people as well as Indians, and the population is 1500. The produce is coffee, cotton, farinha, tapioca, and dyes.

"Between Airão and Moira are the mouths of the rivers Jaú and Uinini, the former a little above Airão, and the latter a little below Moira. When the Uinini is full, it has a communication through the lake Atinieni with the Cuidaja: these rivers are also of clear water. Opposite, and on the north side, is the River Jauâpirí, whose water is also discoloured. This river flows from the mountains called Guiána, and its banks are also inhabited by the Aruâjuis; abundance of nail-wood grows there. Eight leagues from Moira, on the south bank, is a place called Carvoeiro; its population is 700, who live by the cultivation of cotton and making farinha. The buildings are thatched as well as those of Pedroeiro and San Alberto; there has been no priest for many years, but the duty is occasionally performed by one from Moira.

"On the north bank, and opposite Carvoeiro, is the mouth of the large river called Branco, because its waters are white; it is divided into four mouths by islands. This river is very similar to the Amazon; it abounds with fish. Many lakes communicate with it, and on the banks are quantities of wild cocoa. The rivers Itacutú, Emcueni, and Macoârć are its greatest tributaries, and render it navigable almost close to the fortress of San Joachim. By the Itacutú, which receives the waters of the Surumú, the Indians formerly communicated with the Dutch at Surinam, crossing by a short day's journey the isthmus which separates the Itacutú from the upper part of the Ripanuni, which unites with the Esequibo. By this route Colonel Barata went to Surinam with despatches in the year 1793. Forty leagues from the mouth of the Itacutú are the falls, which render the navigation difficult, even for canoes; and from thence to the fortress of San Joaquim, there is a like distance. This fortress was built in 1778, in opposition to the Spaniards, who claimed the sovereignty over the upper part of this river, as they did over the upper parts of the Amazon and Rio Negro, and who had constructed a fort, called Santa Rosa, on the Rio Branco, fifteen days' journey above San Joaquim.

"Besides these two rivers, Itacutú and Surumú, there are also the small rivers Catirimani, Uĉnini, Uanaua, Cauâmé, Porimi, Guiuitau, and Majui, which contribute their waters to the Rio Negro, their sources being in the high mountains whence they flow. These mountains are in some places very precipitous and inaccessible, but with level summits, which are inhabited by wild Indians; these summits are watered by the above-mentioned rivers, and the soil is exceedingly good. The mountain called Caraōmâ, which is near the River Guiuitaú, is the most remark-

able for its height and extent of circumference, which is supposed to be a league and a half. The Indians inhabiting the neighbourhood say that there is a lake at the top, from which the river flows, and that the trees and herbs are of the same kind as on the banks of the River Branco. The fish of this lake are also of the same description—such as manatee, pirarûcú, turtle, and many other kinds which are known to abound in the Amazon.

"Up to this period no mineralogist has ever visited the shores of the River Branco. A few specimens are known, such as Malacaxetas," (the translation of which word I do not know,) "white and yellow chrystals, and other descriptions of stones, which serve the Indians as flints for striking fire; and there is also a mineral salt. Doctors Spix and Martius did not ascend it, but passed its mouth on their journey to Barcellos.

"The nations dwelling near the Rio Branco are in number fifteen, viz., Uapixána, Paraviána, Sapará, Uatarâi, Paracoána, Caixána, Macuxi, Uayca, Porocóto, Atanayru, Uayurú, Tapicarí, Chaperú, Atyâi, and Caripuna. Of these, some inhabit the mountains, others the plains, and the rest the banks of the rivers. They all cultivate the madioca, communicating and bartering chiefly with the Dutch. They have muskets and other European articles, which they obtain by commerçe. The Caripunas are at enmity with all the rest of the tribes, and seize and sell them to the Dutch in exchange for merchandise. There were other towns on this river besides the fortress of San Joaquim, viz., Santa Maria Nova, Carmo, Santa Maria Velha, San Filippe, Conceicão, and the before-mentioned Spanish fort of Santa Rosa. At present Carmo and Santa Maria Nova only are inhabited; the others were deserted in 1788 by order of the Governor, Manoel de Gama, in consequence of the inhabitants having attempted the lives of the soldiers who resided among them. He ordered the inhabitants to remove to the towns of Villa Nova, Alvellos, and the upper part of the Rio Negro. In San Joaquim there are some pieces of artillery, and almost always an inferior officer. In 1793, when Brigadier Manoel de Gama drove the Spaniards from Ega, where they had resided for thirteen years, he sent them to the Rio Branco, where they established themselves. He also transported from the Spanish territory some cattle, and commenced farming in the king's name on the left bank of the river, opposite the fort of San Joaquim. At the same time, two other farms were commenced, and in a few years they brought together an immense population, though contrary to the speculations of various persons, who threw what impediments they could against them. In the meanwhile there were no cattle throve better, and the Rio Branco increased rapidly in population and industry. The imperial farm succeeded thus admirably during the time of Manoel

de Gama, but after his death his successors neglected it, and the cattle, although increased in numbers, became dispersed over the immense and fertile plains, and, being without herdsmen, fell an easy prey to the ounce, which has in consequence multiplied greatly: the Indians say that the Dutch also killed great quantities for salting. It was always considered a happy day at Barcellos when a canoe arrived from Evora, as one came every three months loaded with salt beef, hides, tallow, and cheeses, which, being very cheap, were an advantage to all.

"Returning to the Rio Negro, seventeen leagues from Carvoeiro, is the place called Poiares, situated on high level ground, and with a pleasant appearance. Its church and houses are all thatched; the population amounts to 300. Between Carvoeiro and Poiares are the small rivers Caburi, and on the north bank Uampuxi, Uaniba, and Cuarú, where the inhabitants have their chief coffee plantations and other establishments. From Poiares, on the south side, and distant seven leagues, is the town of Barcellos In the year 1816 the captaincy of the Rio Negro was removed from Barcellos to Barra, and a number of the imperial buildings were destroyed, leaving only the palace, church, and magazine. The town is in a most ruinous state; windows, doors, tiles, tables, &c. lie in heaps; the extensive streets are also filled with hills of ants, which are called Içaubas, and are very annoying, entering the houses by night. The population is reckoned at 500. Padre Sousa considers the removal of the seat of government from Barcellos to Barra as beneficial to commerce, and intimates that the town of Villa Nova da Raynha ought to be the capital of the captaincy of the Rio Negro, as it is the boundary line, and very convenient for commerce.

"Between Poiares and Barcellos, and two leagues below the latter, on the south bank, is the small river Uatanari; and on the north side the rivers Uirauaú, Zamuru-naú, and opposite Barcellos, Buibui. At the distance of sixteen leagues from Barcellos is the town of Moreira, with a population of 60 to 70. Between these two places, on the south bank, are the mouths of the rivers (of middling size) Baruri and Guiuní, communicating with the Jupurá by the small rivers Arataí and Guemeuêri. On the north bank is the river Araca, on the eastern bank of which is another, called Demeuêni; the former of dark-coloured, and the latter white water. It was on these large and small rivers that the inhabitants of Moreira began to form their establishments, when the change of the seat of government took place, and compelled them to abandon them. Seventeen leagues above Moreira is the town of Thomar, on the south bank, on a healthy and level spot; its population is 1500. Continuing along the south bank, between Moreira and Thomar is the mouth of the river Uarirá; and on the op-

posite bank to Thomar is the river Padauîri, of muddy water, on the eastern bank of which is the mouth of the River Uexie-mirí. The Padauîri communicates with the River Orinoco by the River Umaoça, near the place where the Guxiquîari (Casiquiari) leaves that river. The Umaoça and Padauîri do not unite, there being a land journey of half a day between them. Three leagues above Thomar, on the south bank, is the town of Lamalonga, with a population of 140; the inhabitants live by the cultivation of coffee and indigo and making farinha. Opposite this place is the small river Anhori, which communicates with the canal called Uatauri. On the south bank are the rivers Chibarú and Mabá.

"Seventeen leagues from Lamalonga is San Isabel, situated on the north bank. This town has a population of 600; the inhabitants cultivate coffee, indigo, French beans, and other plants. Between San Isabel and Lamalonga, on the same bank, is Yaia; and on the south bank are the rivers Emubaxi, Unuixi, and Uayuâna, all of dark-coloured water, and abounding in fish and turtle. The mouths of these rivers are narrow, but their courses are long, with many lakes and channels, which communicate with the River Jupura. Ten leagues above San Isabel is the small village of Boavista, situated on a pleasant spot on the south bank. Its inhabitants belong to the parish of San Gabriel. Formerly this parish had a population amounting to 3020, almost all Indians; at present it has not a third part of that number, the Indians being dispersed to different villages, where they cultivate the same articles of commerce as is before mentioned.

"Four leagues from Boavista, on the north bank, is the village of Castanheiro-novo, and in the interval on the same bank are the rivers Marauia, Quabú, and Abuâiá, all of white water, and emptying themselves into the Rio Negro: the produce of their banks is chiefly cocoa and sarsaparilla. Also on the north bank, and four leagues above Castanheiro-novo, is the river Cababuri, which communicates with the Guxiquiari, by the river Umarïnaui, and thus with the Great Orinoco. The waters of the Cababuri are muddy, but abound in fish, and the banks with game; there is also an annoying insect, called pium. Opposite, or a little above the Cababuri, is the village of Macarabé; it is on the south bank, and has a small population. It is here necessary to take an experienced pilot, as the river is full of violent rapids and falls. Eight leagues above Macarabé, on the north bank, is the village of San José: the population of this place is a tribe of 800 or 900. From hence, four leagues farther, is the town of Castanheiro-yelho, and opposite, on the south bank, was the village of Camunde, which does not now exist. From hence, eight leagues farther, is the small village of San Pedro. Between Camundé

and San Pedro are the rivers Marié and Curicuriaú, distant from each other five leagues. These two rivers are inhabited by the tribe Macú. These people are wandering, and have no fixed dwelling; they live by hunting, fishing, and the wild productions of the forests. On the western bank of the Curicuriaú is a channel, which comes from the south bank of the Vaupé, and is called Inebú. Eight leagues from San Pedro is the small village of Camanaú, where there are some frightful rapids to be passed, in order to reach San Gabriel, which is distant four leagues. The river here is very dangerous owing to the falls and rapids, and it often occurs that canoes are wrecked among them. The bad passes are called Salto do Viado Cujubim, Hurnas, and Poredão. The falls of San Gabriel are rarely navigable. When the river is high, the canoes are drawn by land; but when low, with great difficulty they can pass. The fortress of San Gabriel, on the north bank, is on an elevated and extensive plain, and in the latitude of 36′ south. The population of San Gabriel and the neighbouring villages amounts to 1200. There is a church with a thatched roof. The river here is full of rocks, rapids, and falls. Close above San Gabriel is the village called San Miguel, and four leagues farther is that of Santa Barbara; the former with a population of 300, and the latter with 700. Ten leagues above San Gabriel is the great and rich river Vaupé, of white water; it falls into the Rio Negro on the south side. Its course is from the west, and parallel to the rivers Negro, Içana, and Xié; it takes its rise in the Serra do Novo Rei, in Granada. The Indians, however, assert that the Vaupé is the branch of a large river which runs to the east towards the North Atlantic, and which is supposed to be the river the Indians call Auiyari (in Delarochette's map, Guaviari), not only on account of its course, but because there is a canal which leaves the Auiyari and flows into the Vaupé. The river Auiyari is either the principal stream, or a tributary to the Orinoco, and from its junction it is necessary to ascend the latter stream to gain the canal of the Guxiquiari, which, as before said, communicates with the Rio Negro, so that by means of the Guxiquiari there is a water communication from the Rio Negro to the Auiyari, to which the Portuguese went (at the time when the purchase of wild Indians was permitted) by the rivers Tiniuini and Yaitá, which flow into the north bank of the Negro above the Guxiquiari; passing from Tiniuini and Yaitá to the Atacaú, which empties itself to the east of the Yatauapú, and the latter to the west of the Inirida, which flows into the Auiyari. At the mouth of the river Vaupé is the town of San Joaquim Coané. Its inhabitants are of the tribe Coeuána, and it is the last place belonging to the parish of San Gabriel.

Twenty-five leagues above San Joaquim, and on the south bank of the Vaupé, is the river Tiquié; on the north bank, lower down, is the small stream Macui. The Tiquié communicates with the river Apapuri, which falls into the Jupurá. When this river is full, this passage can be made in a middling-sized canoe; but when empty or low, a short distance must be travelled by land. There are found in the Tiquié metallic stones, which produce excellent silver. Three days up the Vaupé this river is only passable at very great risk, being full of falls and rapids. There formerly existed a small town above the rapids, but from the difficulty of reaching it by the river it was removed below the danger, where it now is.

"The tribes that inhabit this great river are in number ten or more, under the names of Tarianos, Vaupé, Coeuana, Guereruri, Uanana, Cabéuana, Berenaú, Mamangá, Panenuá, Tucana, and others. [Padre Sousa was among the Tarianas, and baptized many hundreds of them. He describes them as wearing gold ornaments in their ears; and when asked whence they were got, he was informed that they were bought from the tribe called Panenoa, which inhabits the sources of the Vaupé. The tribes of this river are more remarkable for industry than any others on the Rio Negro. They are not cannibals; they perforate the lower lip and ears, the lobes of the latter hanging down to their shoulders, through which they put pieces of wood; they also wear, suspended to the breast, round stones of the colour of milk, and of a cylindrical form, two inches in length, and half-an-inch in diameter. The different ranks of these Indians are known by the length of these ornaments, the longest being worn by the chiefs and nobles.]

"The falls of the Vaupé extend about two leagues, and the river Capuri joins it above them, on the south side, into which latter falls the Cauêdeá. By the Capuri there is a communication with the Jupura. At the mouth of the Vaupé the falls of the Rio Negro terminate. One league from thence is the small town of Santa Anna, situated on the north bank, which now belongs to the parish of Marabitanas. Seven leagues farther is the river Içana, on the south bank. The course of this river is long, and runs from west to east parallel to the Vaupé and Xié; its banks are inhabited by the nations Baniná, Tumayari, Turimari, Deçána, Puctana, and Erequéna. The Erequéna tribe are cannibals; they are warlike, and wear their ears long like the Tarianas.

"From the mouth of the Içana, at two leagues distance, is the small town of San Filippe, situated on the west bank, also belonging to Marabitanas; two leagues farther is that of Nuestra Senhora da Guia; and eight leagues farther is that of San Irão

Baptista de Mabe, on the east bank. Four leagues above Mabé the river Xié falls into the Rio Negro, on the west bank. Its course is parallel to the Içana, between which two rivers is the great mountainous ridge called Serra de Tunui. Nine leagues above Xié is the fortress of Marabitanas, situated on the south bank, and about a degree north of the equator. This fort is the frontier of the Portuguese possessions, and the last parish on the Rio Negro, of the bishopric of Para. The population of this place, with Malié and San Filippe, is 500.

"All the river above Marabitanas belongs to the Spaniards, and their fort of San Fernando is fifteen leagues distance. It has four pieces of cannon of small calibre. On the same side, and near San Fernando, is the town of San Carlos, where the governor resides.

"The produce of the Rio Negro, for the year 1818, amounted to—

5,045	arrobas of	tobacco.
3,512	ditto	sarsaparilla.
5,936	ditto	coffee.
1,948	ditto	cravofino.
1,800	ditto	cacae.
10,425	ditto	fish.
8,034	pots of	manteiga, or turtle oil.
11	ditto	mixira.
17	ditto	balsam capaiba.
733	inches of	piaçaba.
10	arrobas of	aniel (indigo).
350	ditto	quina (bark).
18	ditto	wax.
128	ditto	estupa de terra.
5	ditto	carajurú.
166	ditto	castanhas.
190	ditto	cotton.
120	hammocks.	

The whole amounting to the value of 170,959,200 reis.

The following table shows the time required for a vessel or canoe of 22 tons, to ascend the river from Para to Tabatinga :—

Amazona.	Dry Season. Days.	Rainy Season. Days.
Para to Breves	1½	5
Breves to Gurupa	5	8
Gurupa to Santarem	3	18
Santarem to Obidos	2	6
Obidos to Villa Nova da Raynha	3	8
Villa Nova to Serpa	6	10
Serpa to Barra do Rio Negro ..	5	9

SOLIMOES.	Dry Season. Days.	Rainy Season. Days.
Carried forward	25½	64
Barra to Quari	20	30
Quari to Ega	8	13
Ega to Caissara	1	2
Caissara to Fonteboa	10	16
Fonteboa to San Antonio	10	18
River Içа or San Antonio to San Pablo	7	16
San Paulo to Tabatinga	12	20
	93½	179

In the Amazona (or from Barra to the Rio Negro) the *ventos geraes* (or general winds) begin the end of July and end in December. In the Solimoes they begin earlier, about June, and continue till the month of December. These winds blow strong during the day and always against the current of the river.

The mode of navigation up the river is that of keeping close to either bank, where the current is less rapid. The vessels are somewhat of a schooner rig, but with large square sails for running before the wind; besides the sails they use occasionally oars, and when short-handed warp up by the banks of the river. A canoe of 20 tons requires a crew of 14 Indians including the captain. Descending the river they rarely use their sails, and seldom do more than allow the vessel to drift with the stream.

The towns, missions, and hamlets in the province are as follows:—

Towns—Silvao 1800 souls, Serpa 800, Barba 1000, Moira 1500, Barullos 500, Thomar 500, Ega 2200, Olivença 1800, Barra 8000. Missions—Villa Nova da Raynha 1700, Maues 1500, Canoma 1800. Hamlets—Airaõ 500, Carvoairo 700, S. Joaquim do Rio Branco 700, Poiarez 300, Moreira 65, Lamalonga 140, S. Izabel 600, S. Gabriel 1200, Marabitanas 500, Alvellos 160, Nugueira 1200, Alvarano 500, Immaripi 300, S. Joaõ do Principe 350, Fonteboa 1100, Castro de Avelano 500, Tabatinga 400, S. Joaõ do Crato 400. Total population 32,710.

III.—*On the Maritime Communications of India, as carried on by the Natives, particularly from Kutch, at the Mouth of the Indus.* By Lieutenant Alexander Burnes, Member of the Royal Geographical Society of London. Communicated by the Branch Society of Bombay. Read 11th January, 1835.

In the whole scope of history, no subject appears to have excited more attention than the commercial and overland intercourse which is known to have existed, in ancient times, between India and the nations westward of it. The routes of the caravans have been sketched with care, the goods which they carried have been

readily identified with the modern productions of these countries, and the researches of Heeren and others bid fair to make us as thoroughly acquainted with the markets of Tyre and Sidon as we are with those of Liverpool and Glasgow. The maritime intercourse between these countries is a subject of equal interest, but I cannot find that the same diligence has been bestowed upon it, though that of India, of Western India in particular, as it is now carried on in ships or boats by the natives, rivals in extent that of some of the most civilized nations of Europe. This leads us the more anxiously to inquire into its early history, its rise, and great prosperity. In India we are too apt to suppose that much of this commerce has been established by ourselves; but, vast as has been the impetus given to the Indian by his attrition with Europeans, it is quite evident that this trade existed long before our entry into this country. The primitive build of the vessels themselves would alone suggest this opinion, did we not possess the earliest records to guide us. Even in the book of Genesis * we find mention made of the productions of India among the imports of caravans to Egypt. These imports were no doubt made by way of the Red Sea, since it is a fair and just inference, that since sea-voyages are recorded to have taken place in those ancient times, we may consider that *most*, or at any rate much, of the commerce was transported in that manner, and *not by land.*

I need only sketch the voyages to which I refer. Herodotus tells us that Necho, the Egyptian king, sent an expedition of Phœnicians to circumnavigate Africa, which returned successful after an absence of three years; and this, too, occurred 1500 years before the Cape of Good Hope was doubled by the Portuguese. Nearchus, after having sailed from the Indus to Babylon, would have been dispatched on a similar expedition but for the untimely death of Alexander. The Ptolemies established a regular communication between the Red Sea and India; and in our days we have been fortunate enough, and that, too, by the exertions of a member of the Geographical Society of Bombay,† to find the very port of Berenice from which they set forth on their voyages. To Barygaza, or Broach, on the Nerbudda, the Indian port, I would beg leave to draw the particular attention of those who take an interest in Indian geography. Its position is remarkable: it appears to stand on an artificial mound; bricks have been found in deep wells in the midst of the city; and the modern buildings are, in all probability, a superstructure on the very houses of the ancient Barygaza. Thirteen years have elapsed since I had an opportunity of visiting Broach. Since then, Colonel Tod has made it yield two rare and valuable coins of the Bactrian kings. He sent a messenger to search for them on account of what he had read regarding Barygaza in the ancient authors. Here, indeed, then, do

* Genesis, chap. xxxvii.

† Lieutenant Welstead, Indian Navy.

there exist inducements for inquiry; and I may be surely excused for noticing them in this place, as it is our ignorance regarding this city that interrupts the course of my observations. Without dwelling more minutely on the voyages of antiquity, it will only be necessary to observe that they appear to have been regularly continued down to our own times. The Phœnician, the Macedonian, and the Egyptian, have been long displaced by other nations, but the commerce still exists; and what is perhaps more remarkable, the ships which pass between these countries are now navigated by the Hindoo, and that, too, by the proud Rajpoot! Those who have opportunity or access to books may fill up the history of this navigation from the days of the Ptolemies till India became a province of Britain. I confine myself to giving the particulars of trade from one particular spot—the small territory of Kutch, at the mouth of the Indus. The modern condition of it may supply a hint that will cast light on ancient times.

The principal seaport of Kutch is Mandavee, which stands in lat. 22° 51′ N., and long. 69° 34′ E., close on the Gulf. It has no fewer than 250 vessels belonging to it, and boasts a population of 50,000 souls, which is about one-eighth of that of the whole province of Kutch. It is an open roadstead with a creek. From Mandavee a maritime communication is kept up with Zanguebar and the whole east coast of Africa, with the Red Sea and Arabia, with the Persian Gulf, Mekrom, and Sinde, and with India as far as Ceylon. The vessels used in this extensive commerce vary in size from 100 to 800 candies, or from 25 to 200 tons. They carry a large lateen sail, have two masts, and are never decked. I beg to refer to a paper by Mr. Edye, published in 1834 in the Journal of the Asiatic Society of London, for a minute account of all the craft used in the Indian seas, where a drawing of a Kutch vessel may also be found. It will strike a European with some surprise when he finds these distant voyages performed by such vessels, and the more so, perhaps, when it is added, that they are navigated with precision and no small skill *by pilots who have acquired the use of the quadrant, and steer by charts.* Some of these latter, indeed, exhibit an originality that would not, I am sure, be disputed by Eratosthenes, the first constructor of a map whose name has been handed down to posterity. One of these curious documents accompanies this paper in the very state in which I received it. It is intended to represent the voyage from Kutch to Arabia, and the Straits of Babool-Mandeb and the Red Sea; all of which appear in one direct line, without any reference to longitude or latitude, but, as our old hydrographers would have remarked, with "the latest improvements as to courses," &c. I venture to believe that it will form a specimen of naval surveying which is unequalled in any of the cabinets of Europe, and may perhaps

supply some notion of those charts, the loss of which we so much deplore in the Alexandrian library. I have written some of the English names over the Indian, to render it intelligible. How far such a production is original I am not prepared to say, but I procured it from the "moalum" (pilot) of a boat which had just finished the voyage, and in which I myself sailed from Bombay to Kutch, in May, 1835: however rude, it had served the purpose of the voyage.

But the navigators of Kutch possess other and better charts; they have made transcripts of many of our early surveys; but it is quite apparent that they are copies; and they of course possess, comparatively speaking, little interest. The natives state that their communication with foreign nations has existed for many years; but they assert that an inhabitant of Cutch, a young Rajpoot, named Ram Sing, now familiarly known as "Ram Sing Moalum," or the Pilot, was carried to Holland about a century since, and returned after many years residence there, with a knowledge of astronomy, navigation, ship-building, and other arts, which have been ever since preserved. Various charts and books were brought to me, said to have been his property, which fully corroborate the traditions of the people. The quaintness of expression is characteristic of these times. One of the books is stated to be prepared "from the practice and experience of divers able and expert navigators of our own and foreign nations, containing necessary instructions for sailing between England and the East Indies in the spring and fall, being very much corrected and augmented with several additions." The charts are still more remarkable: one of them represents "the rich kingdom of Bengal, with a mapp of the greate river Ganges, as it emptieth itself into the Bay of Bengala, taken from a draught made upon the place, never before made publique." In this chart the name of Calcutta does not appear, though Hogly then existed. With Hudibras, too, I may observe, that they have "scattered elephants instead of towns" over the land. The country, now so well known as a convalescent depôt north of Bengal, bears the following jaw-breaking name—"Rajia-Weera-Cos-Bhaar-Cos-Assam." There is also a "new mapp of Bombay and Sallsett," which, among "other particulars, shows the place of riding for the winter," and the "going into Bassene," also a fort on the main, called "Savage Castle." In the southern coasts of India we find observations such as these: "thus sheweth the land of Cape Camaroone;" "Balliapatum, where y^e^ 7 saile of Mallabars shielded themselves when they fought Captain Lembry." In the sailing directions Madrasspatam (Madras) is thus described:—"here the Honourable East India Company have a garrison." Throughout all these charts the names of places are marked in the manuscript native character, which shows that

they have not been preserved as curiosities, but are actually used by the people of this country.

The most valuable branch of traffic carried on from Kutch is with the eastern coast of Africa, or, as it is here called, "Swally." Twelve vessels have returned from thence, a distance of nearly 3000 miles, within these few days, laden with ivory, rhinoceros hides, and other valuable articles. I am deterred from entering minutely into any of the particulars of the countries from which these are brought, by believing that Captain Owen, and other officers of his Majesty's navy who preceded him in the survey of these coasts, have already communicated all that is worth knowing. Such is also the cause which keeps me silent on the Red Sea and Gulf of Persia; surveys and descriptive accounts of these, and that too of the most valuable nature, having just been completed by officers of the Indian navy. I will not, however, allow these circumstances to prevent my giving an account of a voyage to "Barbar" in Africa (as the natives call it) outside the Straits of Babool-Mandeb, illustrated as it is by the curious chart accompanying this paper, all the particulars of which I received from the sailors and pilot of the vessel who presented me with it.

In the beginning of this year, the boat named Veerasil sailed from Mandavee: she is about thirty tons burden, was commanded by a Mahommedan, and had, besides the master, a crew of five Moslems, three Rajpoots, and a young negro boy. The cargo consisted of the coarsest cotton cloth, the sale of which was managed by a Hindoo. From Mandavee they stretched out at once to sea, made the coast of Arabia, and touched at Sere, Macullа, and Aden, disposing of their goods as they proceeded, till they reached "Barbar," in the sea of Babool-Mandeb, and outside the Straits of that name. The country called "Barbar" is inhabited by Somaulees; there is no town and no harbour, though the anchorage is safe and good. Barbar is annually frequented by about 100 vessels from different parts of India, during which time a regular fair is held on the sea-beach with the inhabitants, who come from in-land on camels. Immediately a boat lands, each person, even the meanest, must consign himself to a Somaulee, who becomes his "*aban*," or security for life and property. This arrangement is imperiously necessary, for there is no ruler, or chief; and the Somaulees are perfidious, bigoted, and quarrelsome. They have been known to swim off at night to European vessels and murder all the crew. For such protection, a tax of a dollar, or less, per head, and so much for each bale of cloth, is exacted. In return for the cloth, which is the staple article of commerce, they give goats, coffee, gum, and ghee; but chiefly dollars, which they bring from Hurrur, a two months' journey in

the interior. There is no coin below the value of a dollar, and small sums are paid by certain fixed measures of coffee. The Somaulees are all Mahommedans; they do not shave their hair, but go bareheaded, those who have made a pilgrimage to Mecca alone wearing turbans; they have little clothing—the females dress in leathern gowns! The Somaulees have neither guns nor muskets; a few have swords, but all of them carry spears, generally two each, which are about six feet long, including the blade, which is fastened to the cane by a tube, and very well forged. I have seen the instrument as well as the people. The Somaulees have woolly hair, but not the thick lip; they appeared to me a mixture of the Hottentot and Arab; they are a noble-looking race, very tall, and elegantly formed. Of the country I can give no further account, than that there are very high mountains about four miles inland, covered with pasture. Camels are exceedingly numerous; caravans of 400 and 500 of these come and go at a time. They eat them and goats, which are also very plentiful.

While it is strange that the natives of India should keep up commercial communication with a port so distant, it is not less so that the managers of it are timid Hindoo Banians, who trust themselves, without fear, to these bigoted and barbarous Somaulees, though subjected to the most severe privations. When the Hindoos land in Barbar, they are not permitted to wear a turban; if they die, they are not allowed to be burned, according to Hindoo custom, or buried like a Mahommedan. A hole is dug, into which they are put in an erect position, and for this privilege they pay a heavy fine. In Kutch, during the native government, such was the influence of these very Hindoos, that no animal was permitted to be killed in Mandavee, as they considered it sinful to shed blood. In Barbar the whole of the people live on flesh, and the very vessels of these Hindoos are washed by the Somaulees, often after slaughtering goats. Water, which in their own country they will not drink but from the hands of those of certain caste, is brought in skins of animals just killed by Mahommedans. Such privations as these Hindoos suffer can only be accounted for by their love of gain, and the great profits derived from the trade. I dwell upon this because it shows, in a remarkable degree, the sacrifices which the most superstitious people on earth undergo in their search after money. I think, indeed, that we may safely infer from it that commerce was never interrupted in India by religious prejudices; that a people who can enter on it with such sacrifices have been addicted to it from the earliest ages; and that the natives of India themselves, *and not the Arabs*, conducted the trade between India and Egypt.

Such is a brief account of the commerce, as it is carried on in our own days, from one single port of Western India; if the earlier

history of this trade is hidden, we have yet satisfactory proof that the art of navigation, which so much facilitates the intercourse between one country and another, has been materially improved by the return of "Ram Sing Moalum" to his own country. In the history of India the Rajpoots have always figured as heroes and warriors, ever ready to resist, with daring courage and the most chivalrous feelings, the invaders of their soil; they have seldom turned their thoughts to anything but war, and, educated as all of them are in many false notions of rank and honour, they pass their days in civil bloodshed. Behold the change which has been brought about by one scion of this stock being transplanted for a while to another soil! There are at this moment, in Mandavee, no fewer than eighty persons of the Rajpoot race who could navigate a vessel to distant lands, so that from the idlest, the most dissipated, and the least settled of all the Indian community, a class of men of the first utility to a mercantile state has been raised. What is the obvious suggestion to which this fact gives rise? Send a few of the natives of Asia to Europe, and return them educated among their countrymen; they will become, as the Phœnician galley which was cast on the Roman shore, a model which their countrymen may follow, and which, in process of time, will lead to the art of governing themselves as well as their ships on the ocean.

(Signed) ALEX. BURNES.

Kutch, Mandavee, 15th June, 1835.

IV.—*Extract from Lieutenant Wood's private Journal regarding the Lakeradeevh Archipelago.* Communicated by the Branch Society of Bombay. Read January 25, 1835.

WE sailed from Bombay in the Hon. Company's sloop of war Coote on the 6th December, 1834, touching at Rutnagherry on the 7th, and Mangalore on the 15th; and on the 27th December anchored near a reef off the Island of Underoo, or, as the natives pronounce the word, Anderot. It is one of the largest in that Archipelago which we term the Laccadive, and the inhabitants of these isles pronounce Lakeradeevh; deevh, in the corrupt Malabarian dialect spoken here, signifying an island.

The following remarks on the Lakeradeevh Archipelago are from an inhabitant of Anderot. The names are spelled as nearly as I could to suit the idiom of the island. In the cluster there are seventeen islands in all, which I shall class under the heads of islands inhabited, uninhabited, islands forming, or sandbanks. As the contents of the table are gleaned from very imperfect data, the third column has no pretensions whatever to be considered in the light of a correct census; it is merely a rough approximation

to the truth, obtained in a few hours' visit to Anderot, and the different places touched at on the Malabar coast, neither sufficiently tested by cross-examination, nor, what would have been even still more desirable, corroborated by personal observation.

LAKERADEEVH ARCHIPELAGO.

	Islands.		Population.				Articles of Commerce.	
	1	2	3	4	5	6	7	8
No.	Names.	To whom belonging.	Inhabitants.	Origin.	Religion.	Sect.	Exports.	Imports.
1	Ānderot	Bebee or Ranee of Cananore.	1,800	Malabar Coast.	Mahomedan.	Mapply.	Cocoa-nuts, coir, a few couries, and a kind of coarse sugar or jaggery, made from the cocoa nut-tree.	Rice and coarse cotton cloths.
2	Cābārettœ		1,200					
3	Akhātœ		1,300					
4	Kālpânœ		800					
5	Āhmânœ	Ostensibly British.	800					
6	Kadgong		30					
7	Kerten		350					
8	Shâit tu-lacum		300					
9	Sherēah		6,580	Total.			Produce cocoa nuts, and are visited for the coir and nuts by boats from the other islands.	
10	Tātācum		Uninhabited.					
11	Soilee							
12	Tennâkerry							
13	Bangâram							
14	Bâtterā							
15	Cabarettœ Feetœ	unclaimed.	Islands forming sand-banks.				As yet uncovered with vegetation.	
16	Kālpanœ-Feetœ							
17	Ākhātœ Feetœ							

N.B. ā, pronounced as in the French—fable.
â, its sound in the English—fate.
No. 7 and 11 as French words.

The natives, in illustrating the word Feetœ, made use of the phrase New Island, which would imply that their ideas of the formation of these islands correspond with our own. But when pressed to be more explicit, they denied having ever remarked any change in the general features of any single islet, or even heard of their being, at any period, in a less forward stage of formation than as they appear at present; nor could I discover any tradition among them which would lend even a colouring to this supposition. Anderot lies in lat. 10° 48′ N., long. 74° E., as determined by Lieutenant Wedgebrough, of the Bombay marine, who, in 1795, made a partial survey of this group. A more recent, and, from the ever-varying nature of the coral reefs, it is presumed, a more correct one, was finished by Captain Moresby, of the Indian navy, in 1828. I have had no opportunity of becoming acquainted with the labours of the latter.

This island and Kalpânœ are situated on the same meridian, and, with the Elecalpeni Bank, thirty-four miles to the north-east of Anderot, form the eastern boundary of the Archipelago.

Anderot is the principal island; it is nearly of the same size as Cābārettœ, equally fertile with the others, though more densely peopled. Its figure is regular, that of an ellipse, with the greater diameter running east and west, three miles in length and about one broad.

But there is one distinct and characteristic feature about Anderot, which distinguishes this island from the others of the cluster. The other islets are situated leeward of their respective reefs, whereas Anderot not only presents a bold front to windward, but *that front* is one side of the island itself, and not a reef, as is generally the case; the coral reef on which Anderot is based projecting to leeward instead of to windward, south-west being considered the prevalent direction of the wind. In the others, without a single exception, the reefs are situated to windward of the islands. The south-west monsoon is the only wind that prevails with any degree of regularity, the opposite, or fine weather monsoon, being interrupted, in a great measure, by the influence of local causes, arising from the proximity of the Archipelago to the main land of India. In the month of December the current was setting strong to the southward.

Anderot is low, well-planted with cocoa-nut trees, and free from underwood. Its medium height above the sea is about nine feet, but towards the centre of the island, and on its southern side, the surface is lower, and in no part does it exceed the height of twelve or fifteen feet.

The northern side of the island is low, the centre gently undulating, and the south side one continuous sandy plain, with large detached masses of coral rock scattered over it. The little valleys

formed by these clumps, of various figures, are under cultivation and produce, amongst other things, a plant not unlike our rhubarb*, of a most acrid, pungent taste. It is reared as we do Jerusalem artichokes, set in rows, and covered with a manure of decayed vegetation. They have also the sweet potato, but of such an inferior growth, that we can scarcely recognise in it the root we meet in India. A small quantity of rice is grown in the rainy season; not more than fifteen or twenty days' consumption. The rhubarb-looking plant appears to prefer a damp moist soil, for on the more elevated parts of the island there was none to be seen.

Of the soil, the most elevated is the richest. In the valleys, the coarse sand which forms the lower stratum is but scantily covered with a thin coating of vegetable matter; sterile in many places, and presenting a similar appearance to a field on which a compost of lime has been partially thrown; but on the higher parts of the island, where the cocoa-palm has flourished for ages, a deep soil is already formed, which every succeeding season must increase and render more fertile.

There are many wells on the island, and one small tank; but good fresh water is to be had all over Anderot by digging to a moderate depth. Firewood is rather a scarce article, but where the cocoa-nut forms the chief article of food this matters little.

In my ramble over the island I found the plantain, orange, papaw, and lime trees, betel-nut, and two species of cotton-tree, besides a fine stately-looking tree, with dark green foliage, not unlike the broad-leafed elm; this tree yields fruit, but as it was not then in season I know not its nature. The cocoa-nut, plantain, and papaw are the only cultivated fruits; the others are growing in a wild state, and the betel-nut tree excepted, occupy but little attention. Although you meet with nothing amongst the trees which you can term brushwood, there are plenty of creepers and coarse grass.

The natives carry no arms, and are a poor, inoffensive race, like the people from whom they have sprung. They live in low, thatched, stone-built houses, to enter which you must stoop: this form is given to them as offering less resistance, and thereby rendering them more secure in the severe gales they at times experience.

The natives consider the island healthy, but their persons are rather puny than athletic: the number of males is greater than of females. Cows are the only quadrupeds on the island, and they are not numerous; they are of small size, and very lean; the beef of a rough grain, and ill flavoured.

Of birds, there are the curlew, crow, and a long-tailed black

* The plant alluded to here is the *Tacca Pinnatifida.*

paroquet, all very tame; the curlew, which is proverbially a shy bird, remarkably so. Poultry is to be had in small quantities, at from two to three rupees per dozen. The sea affords fish and turtle; the latter we bought at a rupee each, but we could obtain none of the former, although many boats were seen fishing on the reef.

Anderot sends yearly to Cannanore about 4000 maunds of coir, the maund containing thirty English pounds. The following is their method of preparing the coir for market. When full grown and ripe the nut is plucked, cut into a number of perpendicular slices, the husk peeled off, and from this husk the rope is manufactured. The slices are conveyed to the water's edge, buried in large beds beneath high-water mark, and firmly secured by layers of stone placed above them. After remaining in this state from four to six months, they are removed and beaten into a stringy, fibrous mass; which is next exposed to the sun, from which it imbibes a crispness that greatly facilitates the last step in the process of the manufacture, that of twisting; and in this condition it is exported. Coir prepared in fresh water is not so durable as that which has been steeped in salt. A general complaint on the coast against the coir brought from the Lakeradeevhs is, that though the material be good, it is too loosely laid-up to be advantageously employed in the manufacture of small rope, on which account it is confined to cables and other large ropes, in which an uneven strand is not of much consequence.

The produce of the four islands marked as English in the table is monopolized by government, and purchased at Mangalore, free of all expense, for 20 rupees a candy of 560 pounds. In years past government was a gainer by the terms of contract, but this year it has not been able to realize the prime cost of the article. At the last sale the best coir brought only sixteen rupees a candy, being a loss to government of four rupees on each.

As these islands have no safe anchorage, and produce nothing of any commercial value but the cocoa-nut, they can never be of any political importance to us. Unlike those that lie along the Burman coast, they have no harbours to shelter privateers. In the monsoon all intercourse between the islands is interrupted, and their large boats are sent to the Malabar coast for shelter.

V.—*Communications on a North-West Passage, and further Survey of the Northern Coast of America.* Received by the Committee of the Royal Geographical Society appointed 8th February, 1836, to examine them. Read, 23d February, 8th and 22d March, 1836.

(*From Sir* JOHN BARROW, *Bart.*)

" *London, February* 15.

"THE Committee having been pleased to ask my opinion regarding a further attempt to effect a North-west passage from the Atlantic to the Pacific, I cannot hesitate to state frankly what my sentiments are, and briefly on what my hopes of success are founded, should such an attempt be made.

" I may observe, in the outset, that the honor and reputation which England has acquired among the continental nations of Europe, for her successful exertions in extending our knowledge of the globe, both by sea and land, has very naturally created in the public mind an ardent desire, now that we are happily in the midst of profound peace, that further endeavours should be made to complete what has been left unfinished. The expression of this feeling, which I believe was never dormant, has now found a central point to make itself heard, by the establishment of the 'Royal Geographical Society,' among whose objects and duties is that of receiving and considering such plans and proposals for enlarging the sphere of geographical knowledge as may be brought under its notice.

"There have probably not been any voyages or land journeys which excited a more lively interest than those for the discovery of a north-west passage, and those expeditions that were sent out for completing the geography of the northern coast of North America. The renewal of these expeditions is the object that recently urged itself on the attention of the Geographical Society. That portion of the land survey which is still required, being detached parts contiguous to others that are known, would not be of difficult or uncertain accomplishment; and there are grounds sufficiently strong for believing that the question of the practicability of a north-west passage, after the experience that has been acquired, will scarcely admit of a doubt. If this be so, as I shall presently endeavour to show that it is, I think the Committee will agree with me that England would be held altogether inexcusable,—that she would justly subject herself to the ridicule of the world,—were she to suffer any other nation, by her own indifference, to rob her of all her previous discoveries, by passing through the door which she had herself opened: for, be it observed, the honor would descend upon him who first stepped over the threshold, and not on him who led the way to it—just as Vasco de Gama has run away with the honour of having discovered and passed the Cape of Good

Hope, which had been passed and discovered ten years before by Bartholomew Diaz.

"In adverting to this question, it should not be forgotten that for the last 300 years it has never been lost sight of by the government; that it was the favourite object of a queen, of whom England has cause to be proud—the noble-minded and enlightened Elizabeth—that it has met with favour and encouragement from almost every successive sovereign; and that several Parliaments have promulgated rewards, to the extent of 20,000*l.*, for its completion. It has thus, distinctly and unequivocally, become a national object. And when we reflect on the number of brave and enterprising officers it has been the means of bringing forward, the knowledge and intelligence they have acquired and communicated to the world at large in the various branches of science, it is impossible not to wish for the further prosecution of these expeditions. But if, on the contrary, we should allow the completion of them to be snatched away from us by any other power, we shall sustain a humiliating defeat, and give to our rivals a signal victory—the greatest and best of all victories—the conquest of knowledge; not that kind of ephemeral triumph which follows the destructive conquest of man over man, but that which must live, imperishable, through all ages, till Time shall be no more—just as the discovery of a few hundred miles of coast has transmitted to us, and will hand down to the latest posterity, the name of Nearchus, when Alexander's conquests in India, even now but faintly shadowed out, shall be forgotten, or remembered only along with the achievements of his intelligent general.

"The idea of the question of the North-west passage being taken up by some other nation is far from being chimerical. There are two naval powers, either of whom would be ready to take it up were they persuaded that we had abandoned it—it has been the subject of discussion by both; and one of them happens just now to be placed under so many favourable circumstances for attempting it, that I consider it will be matter for surprise if she should not avail herself of them. With improving settlements on the north-west coast of America, close to Behring's Strait—with two corvettes always on the station, and, above all, with a bold, intelligent, and enterprising governor, who passed fifty-eight days on the ice of the Arctic Sea to the northward of Siberia, and whose mind is turned towards geographical discovery—there is every reason to believe that the consent of his government only is wanting to induce him to try his fortune on an adventure, the success of which would confer on his name immortal honor.

"I will now state to the Committee the grounds on which I conceive that the renewal of an attempt to complete the execution of the North-west passage would lead to a successful issue. It has been practically ascertained, by those employed on the Arctic land expeditions, that the current which sets round the Icy Cape, after continuing along the northern coast of America, discharges itself through the Hecla and Fury Strait of Parry into the Atlantic. The only question, then, that remains to be considered is this—Does that

water communication between the Atlantic and Pacific admit of a navigable passage for ships? And, if so, how happens it that so little progress has been made towards its completion?'

"I shall in the first place endeavour to explain the failure. Of the first voyage little need be said—it confirmed the existence of a large opening to the westward, seen and recorded by Baffin, and let the second in command see that there was no visible obstruction, but the most encouraging circumstances for proceeding farther to the westward. Having satisfied the Board of Admiralty of such being the fact, he was accordingly appointed to the command of a second expedition, and proceeded without the least interruption as far as Melville Island, where he wintered; but here the ice that set in was so thick and compact—such masses were thrown on the coast, that he nearly lost one of his vessels; and found it impossible the following season to make farther progress to the westward. In a third voyage the attempt was made down Prince Regent's Inlet, where, by keeping close in with the shore, the ships were beset by the heavy ice, and one of them destroyed.

"It is clear that all these attempts were experimental—the route to be pursued was untried and consequently unknown—the preparation for passing the winter in the icy sea was equally new. Thus circumstanced, it was natural enough to cling to some shore—the very worst plan, as experience has proved, that could have been adopted. We need only look at what happened to Ross in Regent's Inlet; by clinging to the coast, he moved about 300 yards in a whole season, and in the next abandoned his ship. Parry also discovered, when it was too late, that while he was shut up by ice for nine months out of the twelve, there was abundance of open water and floating masses of ice at a distance from the shore, in which he might have moved along in one direction or another.

"Now we know, and I can speak from some little experience, having once been shut up three days in interminable ice, that very little danger need be apprehended for a ship so situated. Indeed, it is but the other day that one of the whaling ships, the *Granville Bay*, was inclosed in the ice, with which she drifted 600 miles, whilst four others, supposed to be fast by the shore, have very little prospect of being relieved before the month of June or July next. There cannot, therefore, be any fear of a man-of-war, by being shut up in the ice—doubled and strengthened as she would be for the occasion—suffering much damage. Besides, the shores of the Arctic Seas afford little or no assistance to the navigators—while they are fatal to any expedition, by the detention they occasion, till it becomes too late to make progress. The plan then should be, to keep in the open sea, whether covered with ice or not—covered, I believe, it never is—the ice may move about in *fields* or separate masses, according to the direction and strength of the wind, but there will always be open water.

"But then comes the main question, 'Where is this open sea to be found?' In my view of the case, it has been already found, and I will briefly point it out.

"We know, from the observations of Franklin and Richardson, that from the several points they visited along the northern coast of America no land was visible to the northward, and that they found the sea mostly free from ice, except in two or three places, where there were small detached masses, offering no obstruction to the navigation even of the Eskimaux canoes. We further know that, in the year 1822, two Russian corvettes passed thirty or forty miles beyond Icy Cape, found an open sea with no ice to obstruct navigation, and a current setting to the eastward. Since then Captain Beechey's master doubled Icy Cape in the ship's longboat, and proceeded seven degrees of longitude to the eastward without any obstruction; no land was seen by him to the northward. There is another important point to be mentioned. Captain James Ross, in his progress on the western coast of the land which has been called Boothia, saw no land whatever to the westward; and his idea is, that the same coast trended up northerly to Cape Walker in Barrow's Strait, where Parry describes a large opening.

"We may therefore, I think, safely infer that between the coast of America and the northern islands (that of Melville and others) there is a broad open sea—open enough for a ship of war to make her way through it. The result of four voyages has shown that no difficulty exists in the navigation of Lancaster Sound and Barrow's Strait; that out of the latter are several large openings on the southern side, through one of which, perhaps the nearest or that about Cape Walker, a ship would easily pass into that part of the Arctic Sea which I have pointed out; and in such case, I do not think it would be presuming too much to express a hope, that the passage would be accomplished—and perhaps in one year.

"The Committee will be aware that expeditions of the magnitude of those now under discussion can only be attempted under the sanction of government and at the public expense.

"John Barrow."

(*From Dr.* Richardson, *R.N., addressed to Captain* Beaufort, *R.N.*)

"Dear Sir,—The very remarkable drift of the whalers that have recently escaped from the ice of Davis's Straits, (showing in a most unequivocal manner the strength of the steady current which flows out of Baffin's Bay,) having, in conjunction with other circumstances, invested the question of a *North-west Passage* with a new interest, and excited the attention not only of the scientific circles, but of the public in general, it seems desirable that the officers who have been employed on the northern expeditions of discovery should record their opinions, and I therefore commit to paper the substance of the conversation that I had with you two days ago on the subject.

"The search after a North-west Passage, though often relinquished when the want of success has depressed the public hope, has been as often resumed, after a greater or smaller interval, with fresh

ardour; and as every one who carefully and dispassionately examines the records of past voyages, and duly considers the current which successive navigators have observed to set into Behring's Straits, along the Arctic coast, and out of the Fury and Hecla Strait, must be convinced that a water communication between the two oceans does exist to the north of America, so it is no presumption to affirm that the search will not be finally relinquished until it is crowned with success. The lead which England has taken in this enterprize has furnished her with one of the brightest gems in her naval crown; and to those who meet every generous undertaking with the question of "*Cui bono?*" it may be replied that the Hudson's Bay fur-trade, the Newfoundland cod-fishery, the Davis's Straits whale-fishery, admirable nurseries for seamen, and the discovery of the continent of North America itself, pregnant with consequences beyond human calculation, are the direct results of expeditions that sailed in quest of a North-west Passage. But it is not on the existence of this passage that my argument for new expeditions of discovery rests; for were it even proved that, contrary to the opinions of the ablest officers who have sailed the Polar Seas, no practicable channel for ships can be found, still I hold it to be the duty of those who direct the councils of the British empire to provide for the exploring of every part of His Majesty's dominions. This would, in the first place, be merely an act of justice to the various tribes that have acquired a claim on England for protection. The deadly feuds between the Esquimaux and the neighbouring Indians* can be terminated only by the extinction of one of the parties or by European interference; and should our repeated visits to those remote coasts be the means of carrying thither the blessings of peace and of shedding the light of Christianity on the benighted inhabitants, it would in my opinion be an ample recompense for all the exertion that England has made and all the expense she has incurred.

"Even on the score of expense, however, it may be easily shown that an exact determination of the geographical position of places often proves of unforeseen importance. How many thousands of pounds, and what an extent of territory, would have been saved to England, and what costly commissions and lengthened conferences avoided, if, previously to the treaty of 1783, an astronomer had been sent out to ascertain the true position of the sources of the St. John, the Lake of the Woods, and other points of the disputed boundary line between the United States and British America! At the period alluded to, the Lake of the Woods was supposed to be nearly due west of Lake Superior, and to be so remote from civilization, that centuries might be expected to elapse before the right to the territory that its assumed position involved could become a matter of discussion. But far to the north as that lake has been ascertained to be, there is now a prosperous British settlement, containing upwards of

* A battle between the Loucheux Indians and the Esquimaux, attended by considerable loss of life, took place two years ago.

nine thousand souls, still farther to the north. The government of the United States, fully aware of the practical advantages to be gained by obtaining a correct knowledge of their extensive territory, have year after year sent out exploring expeditions, for the double purpose of topographical delineation and of impressing the Indian population more strongly with an opinion of their power and good intentions than could be derived from the conduct of small bodies of men wandering through the country, and engaged solely in commercial pursuits. The Russians too have recently, by a series of expeditions, re-surveyed Nova Zembla, the shores of the White Sea, with great part of their northern Asiatic coasts; and they carefully preserve and extend their influence in the north-west parts of America by the presence there of one of their most distinguished naval officers*, having constantly one or more ships of war under his command. It is not too much to expect that England will not long lag behind her rivals in matters which so nearly concern her interests, since she has already gone far beyond them and all other nations in the equipment of expeditions having for their end the extension of geographical knowledge at large, and the general advancement of science. I may also briefly allude to the immediate benefits which navigation as an art has received from expeditions of discovery. The voyage of Columbus, which gave a new world to Europe, made us acquainted with the variation of the magnetic needle; that of Captain Flinders shewed the deviation of the compass from local attraction on ship-board; and the late Arctic expeditions may be considered as the cause of the successful issue of the investigation of the subject, resulting in the beautiful theory of Professor Barlow and his admirable practical contrivance. The problem of the tides, so important to seamen, on which Mr. Whewell and other eminent mathematicians are now labouring, may also receive illustration from an examination of the Polar Sea; and when meteorology, of so much consequence both to seamen and landsmen, but at present in its infancy, shall have made the progress that it may be expected to do, considering what has been done in other branches of science, the observations recorded by former voyagers in high latitudes, and those that shall hereafter be made, may be of great use. Lastly, as Captain Cook shewed the method of expelling the scurvy from the British navy, so Sir Edward Parry was the first that practically proved the safety with which seamen can winter in the coldest climate. It is therefore under a Naval King especially that such enterprises should be undertaken, and I hope that to the present reign will belong the glory of completing the one so far advanced, which can be most easily done while officers trained up to such services are still in the vigour of life.

"The countries traversed by the expeditions of Sir John Franklin and Capt. Back are rich in minerals: inexhaustible coal-fields skirt the Rocky Mountains through twelve degrees of latitude; beds of coal crop to the surface on various parts of the Arctic coast; veins of lead ore

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* Baron Wrangel.

traverse the rocks of Coronation Gulf; whales abound off Cape Bathurst; and, in short, even a cursory perusal of Sir John Franklin's narrative will convince the reader that, in the above brief enumeration, I have not exaggerated the natural advantages of the country whose boundaries are to be explored. To render these advantages available to England, it is not necessary that a ship should be able to perform the North-West Passage in one year. The discovery of a strait in the unknown space to the southward of the alleged peninsula of Boothia (including only about 22 miles between the seas crossed by Captains James Ross and Back), or one leading from Cape Walker down to Coronation Gulf, would be all that is requisite. The true channel once ascertained, the obstruction caused by the casual packing of ice, in one or two narrow passages, would be easily obviated by a proper adaptation of the powers of steam to that kind of navigation; and a steam-vessel, having gained the open sea known to exist to the eastward of the 107th meridian, would find access to the heart of the country by the Mackenzie River, which flows through a well-wooded tract skirted by metalliferous ranges of mountains, and offers no obstruction to steam navigation for upwards of 1200 miles. Having advanced these very general arguments for the completion of the survey of North America,—and I am fully conscious that I have by no means done justice to the cause,—I proceed to the main subject of this letter, namely, a detail of a plan for the execution of the project.

"A reference to the Admiralty circumpolar chart will show at once what has been effected by preceding expeditions, and what remains to be done. The breadth of the American continent, between the entrance to Hudson's Straits and Cape Prince of Wales, comprises in round numbers one hundred and three degrees of longitude, of which ten remain unknown between Captain James Ross's farthest point and Sir John Franklin's Cape Turnagain; there are about six more between the latter officer's most westerly point and Captain Beechey's greatest advance from Behring's Straits; and the unexplored space between the Strait of James Ross and Back's Sea, being 22 miles, is rather more than one degree of longitude in that parallel. The extent of coast remaining unexplored is therefore small when compared with that which has been already delineated. In one season, Sir Edward Parry sailed through 31 degrees of longitude due west from the entrance of Lancaster Sound; and on Sir John Franklin's second expedition, the coast was laid down for 36 degrees on a more southerly parallel, in less than six weeks of boat navigation.

"To complete the survey of the Gulf of Boothia, and establish its connection or separation, as the case may be, with the Strait of James Ross, no better plan can be proposed than the one suggested by Sir John Franklin, of sending a vessel to Wager River, and carrying on the survey from thence in boats; but I leave it to that distinguished officer to give the details of his own project. The one I am about to propose embraces a different part of the coast, and has very greatly the advantage, in point of economy, of any expedition requiring the fitting out of a ship or ships.

"I would propose, then, to complete, in the first place, the survey of the coast to the westward of the Mackenzie; and, secondly, that to the eastward of Point Turnagain;—both which services could be effectually performed by an expedition having its winter-quarters at the north-eastern end of Great Bear Lake. The party ought to consist of not more than two officers and sixteen marines, or sappers and miners, accustomed to the oar, and who have been brought up as joiners, sawyers, boat-builders, wheelwrights, or blacksmiths. I know that men having these qualifications belong to the corps I have mentioned, and would at once volunteer for such a service. It would be necessary also to engage, for the inland navigation, bowmen and steersmen acquainted with the northern rivers, and two Canadian or Orkney fishermen. Previous notice having been dispatched from England, in March, to the Fur Countries, to provide a certain supply of pemmican and other necessaries on the route, and to make arrangements with Indian hunters, the expedition should sail in the annual Hudson's Bay ship, which leaves the Thames in the beginning of June, being provided with two boats constructed of white cedar for lightness, and drawing as little water as is consistent with the requisite capacity for carrying a cargo. It would reach York Factory in August, and, if early in that month, would experience no great difficulty in arriving at the Athabascow, or, under almost any circumstances, at Isle à la Crosse, before the rivers are closed. The latter post would be convenient for the employment of the men during the winter, in conveying pemmican across from the prairies; and from that place, and still more easily from Athabascow, the two boats, containing the officers and fourteen men, loaded merely with the necessary provisions and arms for the voyage, could proceed down the Mackenzie River to the sea, so as to reach it quite as early as it would be desirable to do, and time enough to complete the survey to the westward*.

"In the mean while, the fishermen and the remainder of the party should bring up the stores in one of the Company's barges to Great Bear Lake, where they would erect the winter residence and store up fish, rein-deer, and musk-ox meat, until the return of the exploring party, which would be before the end of September; there would still be a sufficient space of time for the boats being sent up Dease's river, and down a small stream which falls into the Coppermine, laden with pemmican for the next year's voyage, properly secured from wet in tin cases. These should be laid up in a convenient place out of the reach of the spring floods, and the remainder of the stores ought to be transported to the same place early in the spring on the snow. As the distance is small when compared with the portages made on the other expeditions, the whole equipment might indeed be left at the wintering post until the general movement of the party in the spring; but it is better that the men should be spared from fatigue as much as possible in the outset of the voyage. The expedition should be on

* It would be possible to save the officers one winter in the country by taking the route through Canada, but this would greatly increase the expense, and also require the transport of the boats and stores to the Athabascow in the previous season.

the banks of the Coppermine in June, so as to descend that river when it is swelled by the floods of melting snow; the rapids could be passed safely at that time, and the sea be reached in a single day. The distance between the Coppermine River and Captain James Ross's farthest point is not so great by one quarter as that between the Mackenzie and Coppermine, which tract was surveyed in one month. A shorter period may therefore be fairly allotted to the delineation of the former, the more especially as nearly one-half of it has been already laid down by Sir John Franklin, so that a straight course can be steered from cape to cape; and if the south end of Boothia shall not have been determined by another expedition, it may form, without hazard, one of the objects of this one; or any time that may remain between the completion of the survey and the end of August may be devoted to the examination of the eastern side of Wollaston Land, so as to ascertain whether or not there be an open sea between it and Barrow's Straits.

"In the foregoing sketch, the peculiar fitness of the east end of Great Bear Lake for a wintering place, as being a central position between the unexplored parts to the east and west, has been made apparent. Its nearness to the sea-coast is very greatly in its favour, not only as rendering it easily attainable should any accident happen to the boats, but also as allowing the expedition to remain longer at sea. It is also no small recommendation, that the route from the sea, having been twice travelled over, is well known, so that all the obstacles it offers can be provided against. It is also better adapted than any other situation in the country north of Great Slave Lake for the support of a large party; and, indeed, on Sir John Franklin's first journey, Mr. Dease mentioned it as being in his opinion the best spot that could be chosen for a wintering post, though circumstances that could not be controlled prevented his suggestion from being acted upon. Dease River flows through the best hunting-grounds of the Dog-rib and Copper Indians: it was from that vicinity we obtained our supplies of dried meat at Fort Franklin in 1825-26; and Great Bear Lake yields fish enough for the support of a much larger party than it is proposed to employ. In mentioning the principal points to be attended to, I have not said that it is necessary to obtain the concurrence and cordial co-operation of the Hudson's Bay Company, since that enlightened body has never failed to lend its powerful and indispensable assistance to an expedition patronized by government, and having science for its aim.

"No time can be more auspicious than the present for this undertaking; and I trust that the learned Secretary of the Admiralty will exert his influence in procuring the adoption either of this plan, or of a more efficient one, and thus provide for the completion of an enterprise, which, under his fostering care, has made greater progress in a few years than it had done for previous centuries.

"I have the honour to be, dear Sir, yours, &c.

"*Melville Hospital, Chatham,* "John Richardson."

"*February* 6, 1836."

(*From Captain Sir* JOHN FRANKLIN, *R.N., addressed to Captain* BEAUFORT, *R.N.*)

"21, *Bedford Place, Feb.* 10, 1836.

"DEAR SIR,—The arguments set forth in Dr. Richardson's letter for the completion of the survey of the Northern Coast of America are so forcibly put, that I was quite prepared for their being most favourably received by the Geographical Society. The plans which he suggests for the completion of the survey of that portion of the coast west of the Mackenzie, and of the parts east of Point Turnagain, are full of research and interest, and deserve all the consideration and encouragement which I truly rejoice to perceive they are likely to meet with from the Society. The Doctor alludes in his letter to some propositions which he knew I had made in the year 1828, at the command of his present Majesty, then Lord High Admiral, on the same subject, and particularly to the suggestion as to proceeding from Repulse or Wager Bay. On this point, I remember to have had several conversations with you at the time, and since; I trust, therefore, you will now give me leave to offer my opinions to you somewhat more in detail. A recent careful reading of all the narratives connected with the surveys of the Wager and Repulse Bays, and of Sir E. Parry's voyage—together with the information obtained from the Esquimaux by Sir E. Parry, Sir J. Ross, and Captain Back—confirm me in the opinion that a successful delineation of the coast east of Point Turnagain, to the Strait of the Fury and Hecla, would be best attained by an expedition proceeding from Wager Bay, the northern parts of which cannot, I think, be farther distant than forty miles from the sea, if the information received by the above-mentioned officers can at all be depended upon; and that the information received from the Esquimaux was particularly correct in three instances, Parry, in his second voyage, pointedly remarks.

"The plan, therefore, that I recommend, is to send two vessels to Wager Bay, provided with two boats, each constructed as lightly as possible, for the purpose of being transported over the land, yet of a capacity sufficient to carry eight persons, with two months' provisions and a few presents for the natives. The provisions for the coast voyage should be entirely pemmican, and flour or other farinaceous substance. Two of the largest Dock-yard lighters would, I think, answer the purpose, if ships were thought to be too expensive; and would, I conceive, conveniently accommodate from twenty-five to thirty persons each, with the necessary stores, provision, and boats. These vessels should sail with the Hudson's Bay Company's ships at the latter end of May; which ships would, I am sure, readily be allowed to carry a part of these provisions, in case receiving the whole on board in the Thames should bring the lighters too deep for making an expeditious passage across the Atlantic. They should separate from the Hudson's Bay ships after passing through the narrowest part of Hudson's Straits off the Mill or Salisbury Islands, and, keeping outside of Southampton Island, make the best of their way through the

Frozen Strait to Wager Bay. If the season were favourable, they might perhaps reach their anchorage in Wager Bay by the middle of August, and every preparation having been previously made, the crews should immediately be employed in transporting the boats' provisions and requisites for the coast voyage across the portage. The narrowest part of the isthmus appears to be from Savage Sound, though it will probably be found not much broader from Douglas Harbour, where the vessels would be more secure. The relative breadth, however, would be ascertained by a light party in two or three days, and in the most eligible place, thus ascertained, the portage should be made. If the boats and stores could be across the isthmus by the last week in August, the parties fitted to survey the coasts should embark at once, as the experience of all the voyages has shown that the most open ... be expected for three weeks after that time; and this will enable the parties to accomplish the greater part, if not the whole, of their respective objects. I would propose sending two parties from the point on which the embarkation can be effected; the one to trace the coast westward towards the part Captain Back reached, and onwards to Point Turnagain if practicable; and the other to follow the east shore of Prince Regent Inlet up to the Strait of Hecla and Fury, and farther if necessary, to settle the geographical question as to the north-east termination of the land. It would be most prudent to send two boats on each of these services, with a crew of two officers and six seamen: though as nothing is to be feared from the hostility of the Esquimaux in that quarter, one boat, I think, might safely proceed. A boat of 22 feet in length and 4 feet 10 inches in breadth would be of a good size, and if built of thin mahogany could be easily lifted clear of ice by the crew; and for their transport across the portage more men might be employed. The provision, I have said, should consist of pemmican and flour; the latter should be inclosed in several wrappers of water-proof cloth or flannel. The pemmican could easily be made in England, and at no very great expense; it should be packed in tin cases containing fifty pounds each, and hermetically sealed. It could, when thus secured, be left on the sea-coast side of the portage, covered over with stones, without the fear of its being destroyed by the wolves or other animals, in case it should be found that the party reached the sea-coast too late for embarkation the same season. I should recommend, indeed, in such case, that the boats and stores having been carried over be all left on the north side.

"There is little doubt in my mind of the western party reaching the mouth of Back's River without more than the ordinary interruptions of such a coasting voyage; but here a doubt presents itself occasionally to my mind, grounded on the Esquimaux authority, which it is fair to state: viz. whether the supposed strait between the farthest land seen by Capt. Back and that reached by Capt. James Ross does exist. If it fortunately do, then the tracing of the coast as far as Point Turnagain could be continued by the same course of proceeding; if it do not, then a portage would have to be made to effect that object, the extent of which is not at present known,

and which might require more time to accomplish than one season would allow. This doubt causes me to look with particular pleasure on the suggestion of Dr. Richardson as to completing the survey eastward of Point Turnagain from the Coppermine River. If the land be continuous from the most northern point seen by Captain Back to that visited by Capt. James Ross, and no strait should intervene, then unquestionably the boats would be best placed on the western side of that land for the survey of its coast, which might perhaps be continued up to Cape Walker, and thereby gain well-grounded information for the guidance of the ships which I trust will be sent in search of the N.W. passage. Should the strait in question be found to exist, then the expedition proceeding eastward from the Coppermine River, and that tracing the coast westward from Regent's Inlet, would in all probability meet, if they should set forward on their respective enterprises the same season, which might be done. The party from the Coppermine River would at any rate proceed with more confidence, having the assurance of finding vessels in Wager Bay ready to receive them, and being spared the risk of returning very late in the season to their winter quarters.

"I have not dwelt on the strengthening or fitting of the vessels, nor on the situation in which I should place them for the winter, though these are points which you will imagine have engaged my deepest consideration; but it does not seem necessary now to state these in detail. I may briefly say that the vessels must be secured to withstand the contact of ice, and stored with provision for two years, if they will carry so much: if not, a supply should be sent for them by the Hudson's Bay ships to Churchill Fort, which in the summer months could be fetched by one of the vessels. If the vessels were dock-yard lighters and could berth twenty-five seamen each besides officers, which I think they could do, I conceive, when safely moored in some snug place, they might be left with eight men and two officers in each while the boats were absent, a number which could be so left even if two boats were required on each service.

"I had at first hoped that under peculiarly favourable circumstances the vessels might have reached Wager Bay by the close of July, in which case I should have expected the surveys might be accomplished in time for the vessel to get through Hudson's Strait the same season and return to England; but on reference to the preceding voyages to this quarter, I fear this expectation would be somewhat too sanguine. Parry arrived in Repulse Bay on 21st August; Lyons off Wager Inlet 13th Sept.; Ellis, after wintering in Hayes River, 29th July; Middleton in Repulse Bay 12th July, after wintering in the south. And in our first voyage we were only off Cape Digges, Hudson's Strait, on the 19th of August.

"In the observations which I offered at the meeting of the Geographical Society on Monday last, at the request of the President, I concluded by stating that Capt. James Ross and Capt. Back might be considered to have an acknowledged claim for employment on these services, the former if an expedition by ships to discover the N.W.

Passage be sent, and the latter in the command of any party sent to complete the survey of the coast east of the point of his last expedition. This opinion I still hold; but I hope that I shall not be considered as wishing in the least to interfere with the claims of these zealous and active officers if I add, that in case of either of them not being at hand when the expedition ought to sail, I should feel the greatest pleasure in filling his place. You know, I am sure, that no service is nearer to my heart than the completion of the survey of the North coast of America, and the accomplishment of a N.W. Passage.

"Very faithfully yours,

"*To Capt. Beaufort, R. N.*" "JOHN FRANKLIN."

(*From Captain* BEAUFORT, *R. N.*)

"EVERY year seems to bring forward some accession of interest to the great questions of the North-west passage and of the northern configuration of America; and the Resolution of our Society at the meeting of the 8th inst., that Government should be petitioned to dispatch a fresh expedition to that quarter, having led to the appointment of this Committee, I have ventured to state my sentiments on the three plans which have been suggested.

"One of these plans boldly urges the direct accomplishment of the North-west passage by sea; the other two confine themselves to the completion of the coast, either by an inland line of communication, or by the transport of boats from Hudson's Bay; and all three are from such high authorities, so strongly recommended, and so ably argued, that I hope, whatever may be the result, the Council will print them in our Journal.

"That there is an open, and, at times, a navigable sea passage between the Straits of Davis and Behring there can be no doubt in the mind of any person who has duly weighed the evidence; and it is equally certain, that it would be an intolerable disgrace to this country were the flag of any other nation to be borne through it before our own.

"Whenever the wisdom of Government shall think fit to solve this great problem, I am satisfied that the mode proposed by Sir John Barrow is the most prudent that could be adopted. By trying one of the eastern openings which he mentions, the vessels would proceed from home fresh and unexhausted; and if met by insuperable obstacles, or arrested by unusual severity of weather, they would be carried back by the prevalent current to the eastward, or they would winter there with security. Whereas, if, already harassed by a long voyage round Cape Horn, they were to plunge from the westward into those unknown regions, and if from any cause they were unable to penetrate them, they could neither return against the joint pressure of ice and current, nor communicate their situation to any settlement, nor ever hope for assistance. To seize the proper moment for effecting this ambitious object is solely the duty of Government—and the

resulting credit, both at home and throughout the world, will be solely theirs.

"In the meantime, it appears to be no less the duty of the Geographical Society to recommend a humble and more temporary field of action—more appropriate to the nature of our Institution, more easy and economical in its execution, and more certain and rapid in its result.

"Under this impression I would entreat the Council to take every means they possess of persuading Government to fit out a small expedition this summer for Wager Bay, according to the general plan set forth by Sir John Franklin; and I beg leave here to observe, that completing the coast line would necessarily throw much valuable light on the direction and facilities of the passage, while even the accomplishment of the passage (as supposed to exist) could scarcely contribute any thing to the determination of the coast line. Further, an expedition, aiming at the passage and failing, would do almost nothing for geographical science; whereas an expedition along the coast, however incomplete, must add something to our existing stock of positive knowledge.

"If this proposition should be adopted by government, I shall find other opportunities of entering into the details and arrangements; but as the principal feature of the plan, I would now suggest that the expedition should consist of two small vessels, that they should sail in May for Wager Strait, where a full reconnoissance of the isthmus being made, and the opposite gulf being probably gained, one vessel should be comfortably secured for the winter, and the other should return home to impart the progress and prospects of her consort.

"The object of the above process is, that by gradually uniting the known parts of the coast we should vanquish all difficulties by quiet and moderate efforts, attended by little expense and less risk—and like a skilful general, basing our operations on points already in possession, we should secure every step of our advance, as well as preserve every facility for our retreat.

"F. BEAUFORT."

"*Admiralty*,
"*February* 20, 1836."

(*From Captain Sir* JOHN ROSS, *R.N., addressed to Captain* MACONOCHIE, *R.N.*)

"*London*, 5*th March*, 1836.

"SIR—At a meeting of the Royal Geographical Society, held on Monday the 22d ultimo, I was gratified to find that the question of the North-West Passage was again to be seriously taken into consideration, and it was with pleasure that I listened to the papers which were read on that interesting subject. Actuated by the same motives which induced me to employ my time and sacrifice my private fortune, namely, that my country should gain the glory of deciding a

question to which so much importance has been attached, I cannot but be desirous to afford my mite towards its completion; and my anxiety that such an expedition should depart from the shores of Great Britain in a state the most likely to obtain the great but difficult object, has induced me now to take up the pen.

"With regard to Sir John Franklin's plan for finishing the late survey made by Captain Back, I have only to express my unqualified approval, and offer my strenuous support; and it is almost superfluous to add, that Captain Back, whose abilities, intelligence, zeal, and perseverance, have been so manifest on every occasion, ought to be the officer selected to command, and to whom a *carte blanche* should be given. Observing, however, that much stress has been laid on the easterly current, it may be proper to remark, that this current can be fully accounted for, in the summer by the melting of snow, which produces rivers equal in size to the Thames, and in the winter by the continual north winds, which keep the ice in constant motion in Prince Regent's Inlet, and which we often observed to raise the sea near our hut many feet. This would produce the effect mentioned, and the easterly current in Hecla and Fury Strait is, therefore, no proof of a passage at the bottom of the Gulf of Boothia.

"With respect to the expedition which has been recommended to pursue the route of Sir Edward Parry, although decidedly in favour of the expediency of such an expedition, I confess that I cannot subscribe to the manner or the plans proposed for carrying it into effect, it being understood that two bomb-ships, such as were commanded by Sir Edward Parry, are to be employed. And having been, though accidentally, present when the plans were read at the last public meeting, I feel myself called upon to state my reasons for opposing that part of the proposition, lest my silence should be construed into approbation, and more especially, because I am fully convinced that it would prove fatal to every one employed.

"It is on the probability that a passage exists about due south of Melville Island, that is, between it and Cape Walker, that this expedition has been proposed; and although all the indications which were originally held out, as imperative and inseparable from its existence, have been over and over again disproved by every expedition, I am not now disposed to dispute the question, especially as a proof of its non-existence would be almost equally important, since it never can be of use to commerce, nor could the discovery of a passage in that direction in the least affect those made by the Victory. I admit, therefore, that it is still a national question.

"The first inquiry that presents itself is—Why did not Sir Edward Parry, whose zeal, ability, and perseverance, cannot be surpassed, attempt, with his ships of the same description, the method now proposed—namely, to push among the ice into the vortex of the supposed passage, trusting the rest to Providence? The answer is briefly this: no man in his senses would commit such an act of imprudence, with bomb-ships, such as now proposed, drawing eighteen feet, and with a complement of sixty men. No one can declare with more jus-

tice than myself,—'That if we make the best use of what Providence has put within our power, we may safely trust in Providence;' but we are not therefore justified in tempting Providence by running wilfully into such a situation. I shall point out why such an act would be imprudent. The ice which Sir Edward Parry met at the west end of Melville Island did not drift to the southward with a northerly wind, but stopped, and when the pressure increased, took an easterly direction, an undeniable proof that it must have met with some obstruction in going south, otherwise it would have drifted towards the coast of America, no less than 250 miles distant, by the impulse of the wind, for there was no current; it must, therefore, have met with either land, shoal water, or islands, probably the two latter, over or among which the ships must necessarily pass, to reach the said coast. I, therefore, maintain it to be absolutely necessary that ships destined to try this experiment, and drift through by the impulse of the winds acting on the ice which besets them, should draw *less* water than the surrounding ice, which has been ascertained to be not more than nine feet thick. Yet, notwithstanding the example of the Fury, and the many instances we had on board the Victory, in which we owed our preservation entirely to her light draft of water (only seven and a half feet), ships drawing eighteen feet are now proposed! Again, in the event of wreck, twenty men might find subsistence where sixty could not. It has been said that the weight of a large ship is of advantage in forcing the ice; but that, which only holds good in a gale with plenty of room, cannot be put into comparison with the advantages in warping which a small vessel has over a large one: a single man will move a vessel of 50 tons faster than sixty could a vessel of 300; and a small vessel is much more able to sustain pressure than a large one fortified in the same proportion, while the expenses of every description are less. Moreover, in the event of damage sustained in the bottom, a large ship, or one drawing more than eight feet (which is the rise and fall of the tide), must be discharged and hove down, while a small vessel, or one drawing less than eight feet, may be laid on the ground with safety, and repaired in a tide. With respect to provisions, I have by my last voyage proved that a small ship will carry much more, in proportion to her crew, than a large one. In short, if ships such as the Terror and Erebus are sent on this service, with the intention of 'trying their luck,' either by keeping the south shore of Barrow's Strait, or by taking the ice, the probability is, that they and their crews will never be heard of.

"It now remains to be described what would be the most advisable and efficacious plan for such an enterprise.

"I say at once—let proper ships be constructed by government, ships that would only draw from seven to eight feet water when loaded, whose capacity to carry stores and provisions is extended by an increase of length and breadth, and whose form, between a foot *above* the loaded mark and the bilge, is conical, so that they would rise to a pressure. Let one such be fitted with water-tight bulk-heads,

with every kind of solidity given to her timbers, and to this let a small steam-boat be added, with the most approved engine, boats, and provisions for two depôts, and then there will be some chance of success. The vessels, all drawing less water than the ice, will be secure from rocks and shoals; and if damaged, they will be speedily and easily repaired. Finally, in the event of total wreck, the crews being less numerous, may be saved in the same manner as myself and my devoted companions.

"With respect to the mode of navigation, that practised by Sir Edward Parry and myself having been alluded to, I must, in the first place, state, that the comparison between the ice in Baffin's Bay, and that in Prince Regent's Inlet and Barrow's Strait, is fallacious: the ice in which the whalers were lately beset in the former having been large fields of plain ice, steadily drifting down Davis' Straits, without meeting with any obstruction, into an open sea; while the latter, consisting of huge amorphous pieces, were meeting resistance in every direction, and there being no outlet, the pressure in a gale became tremendous. The Fury was, indeed, wrecked near the shore, because she drew much more water than the besetting ice; but it is not the fact that the Victory met with any damage; and when we left her she was in as perfect a state as when she sailed from England. Both Sir Edward Parry and myself have been of opinion that the best chance of making progress is between the shore and the ice; I am still of the same opinion; and I think, that if the question is ever decided, it must be by keeping close to the shore, from Cape Walker, westward.

"In concluding, I must observe, that unless the winter preceding the season in which the expedition sails is found to have been mild in North America, Russia, and Lapland, there is no chance of success. It was in consequence of the reports which I obtained from thence, at considerable expense, that I determined to persevere after the mutiny of the John, and other untoward circumstances. In short, let the ships be ready to take advantage of a favourable season. I regret that my remarks, which I now request you to lay before the Society, do not accord with the opinions of some of its most influential members; but trusting that justice will be done to my motives, I have to assure you, that no one can be more desirous for the promotion of an object so worthy of the nation, and no one would be more rejoiced than myself to hear of the complete success of the enterprise.

"I am, Sir,
"Your most obedient Servant,
"JOHN ROSS,
"Captain of the Royal Navy.

"*Captain Maconochie, R.N.*
&c. &c."

VI.—*Observations on the Coast of Arabia between Rás Mohammed and Jiddah.* By Lieutenant R. Wellsted, I. N. Communicated by the Royal Geographical Society Branch at Bombay. Read 14th March, 1836.*

HAD circumstances permitted Burckhardt to have traversed the sea-coast of Arabia between Jiddah and the entrance of the Gulf of 'Akabah, the accuracy and extent of his information would, without doubt, have left little to be gleaned by any subsequent visiter; but it will be remembered that his researches on that coast were confined to the cities of Jiddah and Yembo', and that the remaining portion was but cursorily visited by him. On this account I am induced to hope that my remarks may possess a value, to which they would otherwise have no claim.

The survey of the western side of the sea of Suez† having been completed on a former voyage, and Captain Moresby having resolved to leave the final examination of the sea of 'Akabah to a later period, our operations commenced at Rás Mohammed on the 28th of February, 1831.

Rás (or Cape) Mohammed is the southern extreme of the peninsula of Sinai. The coast about it is low and rugged, and cannot be discerned at a greater distance than three leagues and a half. Lying off its eastern side, there is a small island‡ of uniform elevation, which is separated from the main by a narrow and shallow passage. The land forming the cape is a long narrow tract nearly divided, about six miles from the extreme, by a deep bay. Five miles further to the northward, a range of mountains takes its rise, and extends nearly the whole length of the peninsula; their general elevation may be estimated at from 3000 to 5000 feet, and during the winter months the summit of the highest is frequently covered with snow.

About ten miles to the northward of the cape, there are two small harbours, which are separated from each other by a narrow neck of land; both are included by the Arabs when speaking of them under the appellation of Sherm§ or Shermún; but they are also separately distinguished, one by the name of Sherm-el-Sheïkh, from the tomb of a sheïkh at the extreme end of the bay, and the more northern by that of Sherm-el-Móyah,‖ from its having some

* The orthography, as far as possible, is reduced to a fixed standard, each letter having invariably its corresponding equivalent. The consonants are to be sounded as in English, the vowels as in Italian. The accents mark long vowels, and the apostrophe the letter 'aïn; *gh* and *kh* are strong gutturals; the former often like the Northumbrian *r*, the latter like the Scotch and Welch *ch*: *a* as in far; *e* in there; *i* in ravine; *o* in cold; *u* in rude, or *oo* in fool; *eï* as *ey* in they; *au* as *ow* in fowl; *aï* as *i* in thine; *ch* as in child. The author is answerable only for the notes marked, A.

† Properly Suweïs, *i. e.* "the little moth."

‡ Tirán.

§ Dsjerm in Niebuhr's Map.

‖ Water-bay.

wells of water in its vicinity. These harbours were visited by Sir Home Popham in 1801, and are marked in his chart as spots from whence water may be procured. At the period of our visit the Hajj* boats were supplied from some rudely constructed wells, near a few date-trees, about 150 yards from the beach; but the water is of a very indifferent quality, and would not be tolerated by Europeans. The Bedouins are unwilling to part with the few sheep they possess, and no other supplies are procurable here. The red and yellow earths which abound in the hills in the vicinity of the anchorage, are used by the Arab mariners for their boats, as substitutes for paint; and near the tomb in Sherm-el-Sheïkh they procure an abundance of rock-salt. As a plan of these inlets accompanies the chart, it will be unnecessary for me to mention more than that, for shipping, the northern one appears preferable to the southern.

Travellers who are proceeding in native boats to Kosaïr, and who are less anxious to visit Thebes, and to sail on that part of the Nile between it and Cairo, than to effect a quick passage to Europe, may probably feel disposed to land here, and proceed on camels from hence to Tór or Suez. The Nákhodás† generally work up to this cape, whence, if they have a fair wind, they run at once to Kosaïr,‡ or otherwise, they wait until they obtain one. Travellers who are also proceeding to Suez would do well to adopt this route during the prevalence of north-westerly breezes, which are frequently of many days' duration, and render a passage through the Straits of Jabál and up the sea of Suez both tedious and dangerous.

Another advantage would be gained by those who are so disposed, in the opportunity which is presented of visiting the monastery of Sinai, which may be approached from Sherm by two routes, viz. Derb Wárah, which is very indifferent, and in many places scarcely passable, but which is preferred by the Bedouins, in consequence of the abundant herbage which it yields, or Derb-Kedd, which is not only considerably shorter, but the ascent, with the exception of one pass, is gradual through valleys of firm sand. The journey, by the latter route, is estimated at two days and a half, and the cost of a single camel thence and back is four dollars.

It is erroneously supposed that Mount Sinai may be seen at sea off Rás Mohammed, and also off Tór: the intervention of the neighbouring hills prevents its being seen from any other spot than about eight miles to the north-eastward of Sherm, from which situation its summit may be distinguished in clear weather.

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* Pilgrimage. † Indian ship-masters.

‡ That is, "the little castle."

The coast runs in a westerly direction from Rás Fartak to 'Aïnunah, from thence it extends to Mowílahh. All former charts* of this part of the sea have erred considerably by not allowing for the curvature which exists between these points. The mistake, without doubt, originated from the circumstance of ships working up as far as Mowílahh, whence it was usual to stand over to the opposite shore, with the north-easterly wind blowing from the gulf. The coast, which is here low and runs parallel to their course, could not have been discerned, and the whole distance across to Rás Mohammed was given as the entrance to the sea of 'Akabah, the breadth of which, at this part, does not in reality exceed seven and a half miles.

In consequence of the coast from Rás Fartak to the harbour of 'Aïnúnah being fronted with numerous coral islets, with narrow and intricate passages between them, barely navigable for boats, we did not approach it in the ship. Near the sea it was low and sandy in some places, and swampy and covered with bushes in others. From one of the islets, Reïmán, we obtained a plentiful supply of firewood. Opposite to this island, on the main, there is a village occupied by some fishermen of the Huteïmí tribe, who by paying a tribute to the Howeïtát Bedouins, are permitted to cultivate a few date-trees in its vicinity. To the southward there are several extensive date-groves belonging to the latter; and from hence to Mowílahh their encampments are very numerous, their flocks large, and the pasturage, especially near 'Aïnúnah, abundant. Sheep, firewood, milk, butter, &c., may be obtained from this and most of the other villages on the coast; but buggalows,† in their passage to Rás Mohammed, rarely, unless driven by stress of weather, proceed so far to the northward.

The harbour of 'Aïnúnah, in lat. 28° 2′ 30″ N., long. 35° 18′ E., is well sheltered from all winds; yet I am apprehensive that the dangers near the entrance, which are exhibited in the chart, will deter mariners from it. With a good pilot a vessel might enter with every facility and safety.

Towards the interior, at the distance of a mile and a half from the beach, between two barren and rocky hills, is the valley of 'Aïnúnah, celebrated among the Bedouins for the abundance and purity of its water. The appearance which is presented by this luxuriant though uncultivated tract, contrasts strangely with the wild sterility of the neighbouring scenery. The Arabs point out some ruins on both sides of the valley, which they say are the remains of a Nazarine‡ town. They were in too dilapidated a

* The writer had no opportunity of seeing M. Rüppell's Charts.

† Bagalau is the Indian name of a coasting vessel.

‡ Nazarine, or rather Nazarene, signifies belonging to Nazareth. Násarí, the Arabic word here rendered Nazarine, is nothing more than "Christian."

state to enable us to ascertain what claim they have to such an appellation, but that they are not of Arabic origin appears evident, since the former occupants have constructed an aqueduct leading from the valley to the beach, at the cost of more trouble and labour than in all probability the Bedouins, under any circumstances, would have bestowed on such an undertaking. The aqueduct is a mile and a half in length, and about two feet in width, varying in height with the inequalities of the ground, the lower portion being constructed of stones cemented together, and the upper part or channel, of burnt tiles; by this the water was conducted from the valley to a reservoir near the beach, of which there are still some remains.

The nature of the soil in the valley, and the facilities which the numerous streams present for irrigating it, are, with the usual apathy and indifference to agricultural pursuits common to the Bedouins, almost entirely neglected; and a spot, which industry in one or two seasons would soon render remarkable for gardens and cultivation, is now overrun with long sedgy grass, and merely nourishes a few dúm* and date-trees.

When the foregoing paragraphs were written, I was not aware that Dr. Vincent, in his Dissertation on the Periplus of the Erythrean Sea, had placed the town of Leuké Kômé near this part of the coast, otherwise I should have been more minute in my observations.

This author appears to have drawn his conclusion from the scanty notices handed down to us by ancient geographers, corroborated by the observations made by Mr. Irwin in his voyage along the coast in 1777.

In selecting Mowílahh as the site of the ancient Leuké Kômé, Dr. Vincent, I think, has been misled by Mr. Irwin's map, in which the islands of Tirán, Barákán, and Senáfer are placed immediately before Mowílahh, so as to afford a degree of shelter to that station, by which it is made to coincide with the description of the ancient port, as given by Agatharchides: the position which Irwin has assigned to those islands with respect to the coastline is most erroneous. Their true situation, which is now given to them, proves that they could afford little shelter to Mowílahh, nor has that station, as will he hereafter pointed out, any harbour or protection from the tempestuous northerly winds that prevail here with intermissions throughout the year.

The channel adopted by the ancients for conveying the merchandize of India, Africa, and the southern parts of Arabia, to Jerusalem, was by the ports of Elath and Eziongeber, situated near the head of the Elanitic Gulf. But as the navigation of this arm

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* The bifurcate palm; Palma, or Cucifera Thebaïca.

of the sea, which, even at the present day, is considered perilous, must have presented insurmountable difficulties to them, it is known that a port was fixed upon near the entrance, but outside the gulf, where the vessels coming from the south discharged their cargoes, and from which depôt, the merchandize was transported by land to Elath and Eziongeber. Thus the tedious passage up the gulf was avoided. It may be observed that the same motive for shortening a dangerous and tedious passage, has at different periods operated in causing the transfer of the trade from the port of Arsinoë, near the modern Suez, successively, to Myos-Hormus, Berenicé, Adūlis, and, lastly, to 'Aden, without the Straits of Báb-el-mandeb.

A glance at the chart, will show that it would have been impossible to have selected a port, the situation of which could have been better calculated for such a purpose than 'Aïnúnah. The coincidence between the nature of the coast here, with the situation of the islands of Tirán, Senáfer and Barákán, and their position and appearance as described in the extracts from Agatharchides, quoted in Dr. Vincent's work, is very striking.

The appellation of "white," which was bestowed on this and several other towns on the coast, might still, from their being constructed of the same material as formerly, be continued to those at present in existence: the glare produced by the sun shining on the coral renders them distinguishable by their whiteness from a great distance.

The country bordering on the sea-coast in the vicinity of 'Aïnúnah, and extending thence to Mowílahh, affords better pasturage than any part of the coast which I have seen. In this tract the Bedouins' huts are numerous, and large flocks of sheep and goats are met with. Their residence here is however merely temporary, for should the rains fail them—an event that occurs about once in four years—they retreat from the low country to their mountains. In this elevated range, of which many hills are 6000 feet in height, they possess abundance of water, and a never-failing supply of herbage. In some of their valleys they have also extensive date groves and fields of dhurrah,* which they compel their slaves to cultivate.

The Howeïtát Bedouins occupy the coast from Maghwah to Jebel 'Antar, comprising the mountainous tract which rises about ten miles from the beach, extending as far as the Syrian Hájj station of 'Akabah. They were frequently engaged formerly in expeditions against distant tribes in Nejd, from whom, protected by the unapproachable nature of their fastnesses, they entertained no fear of retaliation, and, as bold and expert warriors, they were,

* Sorghum vulgare.

before Mohammed 'Alí obtained so great an ascendancy in Hejáz, much feared by the caravans; but the dread they entertain of the Páshá's power, and an annual present of grain and money to their sheïkh, render them now much more tractable.

The Bedouins in this part of the coast mostly subsist on what is procured by the sale of their flocks and their butter.* The former is taken to Nejd, and there exchanged for grain, principally dhúrrah; the latter is either disposed of to the Hajj boats on the coast, to the caravan in its passage through their territories, or is carried to Yembo' or Jiddah, where a ready sale awaits it. Their food, while residing on the coast, consists mostly of milk and dates, occasionally, though rarely, varied with grain or animal food. The latter is never partaken of, unless on some occasion of festivity. They possess no boats of their own; and the Huteïmí, in addition to a tribute which they pay of two dollars a-head per annum, for protection, supply their masters with fish, large quantities of which are also salted by these fishermen, and conveyed into the interior for sale.

The dress of the sheïkh and the better sort consisted of the 'abà or cloak, procured from either Syria or Egypt, striped vertically black and white, and a loose shirt of unbleached cloth, extending as low as the knees, and bound round the waist with a leathern girdle, in which is thrust a long crooked knife, or sambír, their ammunition, and the apparatus for striking a light, which a Bedouin is never without. The poorer sort wear the same description of shirt, with a cloak of darker colour and coarser texture. The sheïkh and a few of his followers only wore the striped red and yellow kerchief,† in such general use in other parts of Arabia; and all the tribe therefore permit their hair to grow, which is generally plaited, and reaches as low as their waist. When this tribe was subjected to the sway of the Wahhábís, the Bedouins were compelled to wear their hair close, in conformity to a custom established by those sectarians; but when the power of the latter became broken, the Howeïtát returned to their former usage.

Shortly after our arrival we received a visit from the superior sheïkh of this tribe, whose name was 'Aláyán. He was about fifty years of age, of a spare but vigorous make, and his manners mild and placid. He spoke, as do all the Bedouin chiefs in his pay, that we have met with, in high terms of Mohammed 'Alí; yet it is not difficult to perceive that they and their followers would hail with satisfaction the removal of the restrictions to their former habits and pursuits, which the Páshá's success in Hejáz gave

* G'hí in the author's MS., but butter thus liquified is an Indian, not an Arabian production.

† Samhander according to the MS., but probably a mistranscription.

him the power to impose, and which his address and talent have enabled him to continue.

From the sheïkh we learned that camels might be procured here to proceed on to Gaza in four days, to Jerusalem in six, and to Deráyah* in nine. By the former of these routes, packets from India might be conveyed with great facility to the shores of the Mediterranean. After securing the interest of this chief by means of a few presents, we were permitted to roam over the country without any interruption. The wild Bedouins, none of whom had seen Europeans or a ship before, when admitted on board, testified few symptoms of curiosity or surprise. On the second night after our arrival, 'Aláyán and about a dozen of his followers slept on board. Prior to retiring to rest, without its being solicited or hinted at, they gave up their arms to be taken care of until the morning. Such a measure with their own tribes, between whom it is well known the laws of hospitality are preserved inviolate, would have drawn no attention, but with us, who were strangers, and whose visits, observations and proceedings on their coast were at least calculated to excite suspicion, it was a mark of confidence as unexpected as it was pleasing. On shore the behaviour of these Bedouins was very friendly, and we were never permitted to pass their huts without being invited to partake of what they afforded; for this they neither asked, nor would they accept of any remuneration. In their dwellings, which are very small, and constructed of a few upright sticks about six feet in length, surrounded by cloths made of sheep-and goats' hair, and covered with the same material, they had neither furniture nor bedding, further than the clothes they had on; and their only utensils were a few cooking pots, a bowl for holding milk, and some jars containing either butter or g'hí. Unlike the generality of Bedouin tribes, they did not appear jealous of their women, or solicitous to conceal them from our view. We conversed with them freely on these occasions, with their faces uncovered; but whenever we met them abroad, the mouth and lower part of the face was concealed.

About seven miles and a half to the southward of 'Aïnúnah there is a low, sandy, and somewhat bushy island, which has a few huts on its northern end, belonging to the Huteïmí tribe. The ship anchored off its southern extremity, in a channel between it and the main, the latter distant about half a mile. The coast in this part forms a low table-land, intersected by numerous valleys leading from the interior towards the sea. At the period of our visit, the lower parts and sides of these valleys were covered with trees and long, coarse grass, with numerous wild flowers and

* The capital of the Wahhábís.

plants. The trees were principally of the Mimosa kind, with some few Acacias.*

Mowílahh is merely remarkable for its castle, which, with several others, was built on the route of the Egyptian caravan, to serve as a *granary and halting place.* They differ but little, save in size, from each other. They are constructed of hewn coral, cemented with mortar; their shape is quadrangular, flanked with round towers, in which are placed some old guns, some of which are broken and others dismantled. The upper part of the walls, which are thirty feet in height, is pierced with loop-holes for musketry, but their extent would require a large force to defend them. The interior, along the southern and western sides, is occupied by the troops, the northern and eastern being appropriated for the reception of grain, &c.

Mohammed 'Alí, upon whom has devolved the whole government of Hejáz, furnishes these stations with the necessary supply of grain; and the garrison, consisting of an officer, corresponding in rank to our serjeant, and fifty men (Maghrebín† soldiers), is also paid by him. I observe that all the castles on the Syrian Hajj route are also garrisoned by Maghrebíns.

On the arrival of the caravan, the soldiers only who accompany it, are permitted to encamp within the fortification; the pilgrims and the Bedouins pitch their tents outside, near the walls, about 200 yards on the north side of the castle. Here, during their stay, a brisk trade is carried on with the Bedouins, who assemble from the surrounding country, bartering their sheep, g'hí, &c., for powder, cloth, &c. Scattered among the numerous date-trees that surround the castle, there are about 150 huts constructed of cadjans, and some few stone houses rudely built, which are occupied by the Bedouins who cultivate the trees. A few also reside here for the purpose of supplying the small Hájj boats that put in with provisions and water.

Near the wells, which are constructed and lined with stone, there are some gardens which produce grapes, the nebek,‡ melons, &c., with a few vegetables, barely sufficient for the consumption of the garrison. Sheep can be purchased here from the Arabs; also water, which is good, and firewood, but the latter is indifferent and its supply uncertain. Small boats occasionally visit Mowílahh for these necessaries, but the larger bagalás proceed to Sherm.

The coast in the vicinity and to the northward of Mowílahh is low, gradually ascending with a moderate elevation to the distance

* By Acacias the author probably means the tal-ḥ, or Acacia Gummifera, which produces gum arabic; for Mimosas and Acacias do not differ from each other by any strictly natural peculiarity.

† Barbaresque Arabs.

‡ Rhamnus Nabk.

of six or seven miles, when it rises abruptly in hills to a great height, those near Mowílahh terminating in sharp and singularly-shaped peaks. When viewed from the northward, several of these are shut in, and form a narrow ridge. The height of the most elevated was found to be 6500 feet, and it obtained from us the appellation of "Mowílahh High Peak." From the southward, these peaks have an irregular columnar appearance, with chasms rather than valleys between them. They have frequently been noticed by navigators in their passage up the sea; and I observe Mr. Irwin, who sailed by this part of the coast on his way from Yembo' to Kosaïr, has styled them the Bullock's Horns. To me the whole group seemed to bear a great resemblance to representations which I have seen of enormous icebergs.

I shall notice but briefly the islands which lie off this part of the coast in a line between Mowílahh and Senáfer, since the sailing directions will embrace all the information relating to them that is of practical interest.

The island of Shushú'ah,* the northern of the group, forms at a distance like a gunner's quoin; its height gradually increasing from a low point on the northern extremity, to a bluff elevation forming its southern termination, which has a height of 350 feet. The whole island appears formed of red and yellow (variegated) sandstone, mixed with coral; large masses of the latter, of the circular form (Madrepore), so often met with on reefs near the surface, may, when the rain has washed away the soil, be seen embedded in the rocks; and the loose broken pieces of the branched kind, petrified shells, and other marine remains, are thickly strewed over the surface. The Palinurus anchored here in a small bight on the north-east side of the island, between two reefs, and narrowly escaped being wrecked during a gale from the northward. I have since learned, that on the same spot was lost one of those enormous vessels that formerly traded between Jiddah and Suez.

From the boisterous weather and numerous rocks in this part of the sea, the navigation is so exceedingly dangerous, that scarcely a day elapsed without some hair-beadth escape. It would have been impossible to have conducted a ship of greater burden, or one less quickly manageable, amidst the labyrinth of shoals through which we had often to thread our way.

Barákán is divided into two parts, which are connected together by a low sandy tract; so that the two quoin-like hills into which it rises at a distance, appear as two separate islets. On a nearer approach, its broken and rugged appearance is very remarkable; large masses have been detached from the body of the hills, and lie scattered at their bases. The anchorage here is small and indifferent.

* Abú Shúshah (Rüppell).

The Island of Ye'úbáh * is higher than either Barákán or Shushú'ah,† but its appearance and formation are the same.

The positions of these islands were fixed in the old charts with tolerable precision, but the coast line about Mowílahh was drawn much too far to the westward. The nature of the shore, and the fact of its being seen in clear weather, added to the dread which mariners entertained of approaching an unknown and dangerous coast, most probably induced to this error.

On approaching the shore from seaward it forms in narrow parallel ridges, which successively rise without any observable increase or decrease of shade; so that the land at the distance of twenty miles presents nearly the same appearance as it does at ten, and in both instances appears close to the vessel. This extraordinary clearness and purity of the atmosphere is mostly observed in December, January, and February; and during this period, the outline of any object on the horizon, however distant or small, may be observed with the utmost distinctness: the brilliancy of the nights is also very great, and facilities are thus afforded to the mariner for making celestial observations, which in the navigation of this part of the gulf he will find of essential service.

Sherm Yahár may be entered without any apprehension; it has excellent anchorage, is spacious (at least, contrasted with other inlets on this coast), and well sheltered from all winds. Wood and water, in small quantities, may be procured from the Bedouins, who bring these articles from Mowílahh and the interior on camels, for sale, to the boats that put in here on their passage up and down the coast. On the northern side of the entrance a pile of stones has been raised by the Arabs, without which it would be difficult to distinguish it.

At Sherm Dhobá the anchorage is small and inconvenient, and could only be made available for boats or small vessels. It is likewise difficult of egress, which can only be effected in the morning with a land wind, at which period a heavy swell is experienced at the entrance; so that should it fall calm, a vessel would probably be set on the rocks. At the distance of half a mile from the beach, and fronting the anchorage, there is an opening in the range of hills which runs parallel with the coast, through which an extensive view of the interior is obtained. Fronting this opening there are several dúm-trees, and a few yards further to the right some wells with an abundant supply of water. They were sunk by Sultán Selím I. for the use of the pilgrims on their route to and from Mecca, and are constructed of hewn coral, mortised in with care. They are about fourteen feet in diameter, and twenty in depth; the water procured from them is tolerable, but inferior

* Yebú'ah (Rüppell and Niebuhr). † Abú Shúsheh (Rüppell and Niebuhr).

to that obtained at Wej-h. A few deserted huts were left near this spot; we saw no inhabitants, as it is only occasionally visited by the Bedouins for the convenience of obtaining wood and water. Of the birket, or reservoir, mentioned in an itinerary procured by Burckhardt, we saw no traces.

The Island of Na'mán* is long and narrow; its hills are skirted with a few bushes, but are otherwise destitute of vegetation. The hills are almost entirely composed of coral, and have a very rugged appearance. Na'mán is much frequented by native vessels in consequence of the excellent harbours which are found on its eastern side.

Nearly opposite to this island, or main, there is an anchorage called Mersa Ezlam; about three miles from which, towards the interior, there is a castle now in ruins. The garrison was withdrawn, and it ceased to be considered as a halting place for the caravan, in consequence of the indifferent water in its vicinity. Pilgrims now halt here only a few hours, and proceed on to Dhobá. This castle marks the southern limits of the Howeïtát Bedouins; from thence the coast, as far as Sheïkh Morábit, is occupied by the Bilí tribe.

In Sherm Jezzeh there is no anchorage. We saw several Bedouins here who brought down sheep for sale; their behaviour on shore was very friendly. Several fishermen of the Huteïmí tribe had also taken up their temporary residence here. The country in the vicinity of this and the neighbouring sherms is remarkably barren and destitute of vegetation. A stratum of black stone on the surface of the hills and plains gives the whole a bleak and desolate appearance. The coast is partly fronted with steep overhanging cliffs of coral and sandstone. From the base of these, to the distance of about forty yards, extends a level band of rocks, the outer part of which is nearly dry, and rises like a wall from an almost unfathomable depth; against this the sea, meeting with a resistance so abrupt, breaks with some violence, and produces a considerable surf, which would render landing on the intermediate coast between the sherms almost impracticable.

Sherm Wej-h † is a small cove, affording excellent anchorage and shelter. Some soldiers from the neighbouring fort, and a few Arabs of the Huteïmí tribe, reside here in huts erected under some cliffs on the northern side of the cove. They gain a tolerable subsistence from supplying the Hajj boats with fresh provisions and water. The former consist of sheep, goats, g'hí, honey, salt-fish, &c., all of which being here good and cheap,

* Or Nu'mán.

† Perhaps 'Owejeh, or 'Owájeh, from the tribe of that name. See Burckhardt on the Bedouins, pp. 219, 436; and probably the Wush (Wusch) of Niebuhr's "Description de l'Arabie," p. 536.

considerable quantities are disposed of. The latter, besides being plentiful, and procurable at a moderate rate at all seasons, is far better than what is elsewhere to be met with in the Red Sea. It is brought from wells near the fort, about three miles in the interior, on asses and camels, or by women. I observe on this coast, that with the exception of the above-mentioned tribe, Arab females are rarely found engaged in manual labour until they have passed the middle age. Wej-h is furnished with an abundant supply, and a great variety of excellent fish.

The ranges of reefs parallel to the shore, through which it is necessary to proceed in approaching other sherms on this coast, would probably deter mariners from visiting them, unless in cases of necessity; but Wej-h is free from this disadvantage. In approaching it, the island Ríkhah,* which lies off the entrance of the harbour, at a distance of seven miles, forms an excellent mark for entering.

On the day of our arrival we received a visit from the principal sheïkh of the Bilí † tribe, Sheïkh Amír. His power extends inland six days' journey, and coastwise from Sheïkh Moiábit to the southward as far as Hasání. The general appellation of the various hordes who occupy this tract is Bilí, and their number is said to exceed 7000. The sheïkh, though aged, appeared still active and vigorous; though much pleased with all he saw on board, yet, contrary to the general habits of other chiefs who visited us, he asked for nothing, and appeared as much surprised as delighted when a few trifling presents were made him. He receives from Mohammed 'Alí an annual present in cash and grain, for which he guarantees a safe passage for the supplies to and from the fort, and probably the safety of the fort itself.

On one of the officers expressing a wish to visit his encampment he appeared much delighted, promised his utmost to entertain all who felt disposed to go, but remarked, that as it was three days' journey distant, it would, at this advanced season, be too fatiguing. He gave us intelligence of the existence of a ruined town in the interior, about four hours from the fort, and also that there were some inscriptions cut on the face of hills on the road to it. I was in consequence directed to proceed on the following morning, for the purpose of ascertaining the fact.

Proceeding over a low plain, which is marshy near the sea, and covered with a saline incrustation, we reached the fort, which is about three miles in a S.E. direction from the anchorage. It is, as I have before noticed, though somewhat smaller, built in the same style, and garrisoned in the same way as that at Mowílahh. On

* Reacha in the MS., which may be Ríkhah, Rékhá, Riyáchah, Riyachá, Riyakhah, &c., such is the uncertainty of our orthography!
† See Burckhardt on the Bedouins, p. 224.

the N.E. side, near the wells, there are a few small gardens, producing a few fruits and some vegetables. To the westward there is a small burying-ground. I noticed here a peculiarity in the mode of interment, which I have not before heard of or met with. After the body is placed in the grave, the latter is not as usual filled, but is left covered only with a large slab.

The fort is nearly surrounded with hills, those on the eastern side rising so close to its walls that a few Arabs armed with matchlocks, and sheltered by the rocks scattered over the surface, would soon render it untenable.

I had considerable difficulty in procuring a guard from the fort, in consequence of the absence of our friend the sheïkh, without whose sanction (such is the dread they entertain of the Bedouins of this tribe) the commandant declared it would be impossible to proceed into the interior, or even to the distance of a few hundred yards in that direction from the fort; but after a delay of several hours, a party of the garrison volunteered to accompany me, and we proceeded on our journey attended by about a dozen men. They seemed, however, to entertain considerable apprehension of being attacked, for they proceeded with their matches, and whenever we approached a suspicious spot, a scout was sent forward to reconnoitre. I have since heard, that a marauding party from the hills, which had been seen prowling about here, was the cause of these precautions.

After leaving the fort, we continued in a S.E. direction through a valley, where fresh water is obtained, at the depth of one or two feet from the surface, by the Bedouins, who merely scrape away the sand and leave the water to settle in the hollows thus formed.

On either side of this valley are hills of dark granite, which rise to a considerable height, and terminate in rugged peaks. A singular effect is produced in the appearance of these hills by veins of white quartz, which run either vertically or diagonally through the strata. Near the termination of this valley on its western side, at the distance of half a mile from the castle, we found the inscriptions—(see next page)—which we sought, engraved or rather scratched on the face of the rock.

After leaving this valley, called by the Bedouins Wádí-l-Móyah,* we continued our route in a S.E. direction, passing over several plains interspersed with spots clothed with luxuriant vegetation. A small yellow flower, then in bloom, gave to these an appearance not unlike fields of ripe corn, which presented a singular effect when contrasted with the burnt and parched appearance of the surrounding desert.

At the distance of about ten miles from the fort, after winding for some time among the hills, we arrived at a rocky valley in which

* Móyah is the Bedawí and vulgar Egyptian word for má, "water."



were the ruins. The general direction of this valley was N.E., and through its whole length (about two miles) extensive ruins were perceived scattered at various distances; across it two hills projected, leaving a narrow defile between them. On the brow of both hills we saw traces of two small forts. Amidst the ruins of the houses, I measured the remains of walls which were six feet in thickness, and had been built in some places of hewn stone. I conceived, from the ruins being of so massive a construction, that it could not have been an Arab town, and the Bedouins, when referred to, pronounced it to be of Nazarene* origin, but beyond this there was nothing to warrant my forming any opinion as to its character.

Adjoining the ruins there is a singularly formed hill of limestone, from the southern side of which the materials used for constructing the town appear mostly to have been taken. The Bedouins who accompanied us pointed out the mouths of several caverns, but no persuasion or offer of reward would induce them to enter what they believed to be the abode of spirits.

I had been informed of the existence of caves near this spot, and had therefore provided myself with ropes and lights. After penetrating to some depth, and in various directions, I found that the centre of the hill had sunk considerably, leaving between the roof, which was a mere shell, and the parts that had sunk, extensive

* That is, "Christian." See note, p. 53.

cavities, which served as a retreat for hyenas and jackals. We found the bones of men, camels, &c., which these indefatigable prowlers had brought from different parts of the desert. A musket fired inside sent several of them scampering out, to the great terror of the Bedouins, who were standing at the entrance waiting with great interest the result of our undertaking.

During our stay at Wej-h, boats were constantly arriving with pilgrims. At one period there were about 4000 people assembled here, mostly from Constantinople and the Barbary States. With these the officers and crew had frequent intercourse, and never experienced on any occasion the slightest approach to insult or interruption. This fact, as relating to a race hitherto considered so intolerant, is worthy of remark. Within their cities the dread of punishment from the authorities would, it may be supposed, prevent them from pursuing an offensive line of conduct towards us, but here, to a certain extent, it might with safety be indulged in. This would show that the religious prejudices of Mussulmans are fast yielding to the beneficial effects produced by a more extended intercourse with civilized Europeans.

Quitting Wej-h, we ran down to the adjoining Sherm 'Abbán, which is sheltered from all winds (being completely land-locked), and has good anchorage for three or four vessels. Near the entrance inside, there are several rocky patches which may be easily distinguished by the discoloration of the water. Fresh water may be obtained here in small quantities from the Bedouins, who bring it from a small village about three miles distant in the interior. Near the extremity of this sherm some dhourrah is cultivated. Bearing west from Sherm 'Abbán is the island of Merdúnah, which is remarkable for its appearance and formation. A narrow ridge of coral is detached into pointed masses, varying in height from two to three hundred feet; the cliffs and hollows of these afford shelter to numerous flocks of wild pigeons which breed on the island.

The broken and rugged appearance of Merdúnah has given rise to a singular tradition among the Arabs. They believed it to have been the abode of spirits who resort there in order to amuse themselves at night with hurling rocks at each other.

From Rás Gharkúmah to Rás Abú Medd, the coast is fronted by a group of low sandy islets and reefs, which are connected together by an extensive bank of soundings, interspersed with isolated rocks. There are channels between them frequented by boats, but no ship could venture to navigate them. One of these islands retains the name of Sheïkh Morábit, from an old priest * who resided here about seventy years ago; a tomb of rude con-

* Rather "monk," or "anchoret." The Mohammedans have no priesthood.

struction, which has been erected to his memory, is visited by the Arab mariners.

On one of these islands under which we anchored, named Atawál,* there is a large fishing village, which was unoccupied at the period of our visit. Opposite to Atawál on the main, at the distance of two miles from the beach, lies the hajj station, El Haurá or Dár-el-'ashrín.† Here there is a copious supply of water, which gushes from the rocks, and abundance of herbage. In its vicinity, according to the report of the Arabs, there are some remains of buildings and columns; but our stay on the coast was too limited to permit our examining the spot. Near this station the encampments of the Billí tribe to the southward terminate, and those of the Joheinah commence.

Hasání is well known to navigators, who generally notice it in their way from Jiddah to Kosaïr and Suez. We found its greatest elevation to be 400 feet on its north side, whence it slopes away to the south-eastward. Off the north side there is a small island called Libnah, between which and Hasání there is a narrow channel, navigable for boats only.

Indifferent water is obtained here in small quantities (and that only during the winter season) from some wells near a sheïkh's tomb; but the quantity required for the consumption of the inhabitants and that to the hajj boats, is mostly brought from the main. During the warm season the Arabs leave the coast for this island, in order to avoid the great heat of the continent, as well as for the purpose of disposing of their grain, dates, &c., to the hajj boats, which put in here. They are all industrious fishermen, the sea in this part abounding in fish, which, when dried and salted, is exported for the Cairo market, or disposed of to the neighbouring tribes. They are more opulent than the other Bedouins on the coast, who are rarely engaged in this pursuit. During their stay here they reside in a long straggling village on the south side of the island, in huts constructed of cadjans.‡ It speaks much in favour of the honesty of the Arabs who navigate this coast, that we found in these houses, on our first arrival, many useful articles left without any one to protect them. On the main, this tribe possesses an extensive tract of country, well irrigated by numerous pools of fresh water, yielding them an abundant supply of dates which are considered scarcely inferior to those of Medína. A letter from sherif Serur, at Yembo', to their sheïkh, procured us promises of an escort to any part of the inte-

* At-tawál for Al-tawál, "the long island?"

† The twentieth house or station on the pilgrim's road. See Burckhardt's Arabia, p. 456.

‡ That is, of flags or broad-leaved rushes: kájang is a Malay word used by the Anglo-Indian seamen to signify "a matted awning."

rior we might feel disposed to visit; but his departure up the coast, shortly after our arrival, prevented our putting his good faith to the test. Though a distinct tribe, they bear the general appellation of Joheïnah: their number, amounting formerly to 2000 men, has been considerably thinned by the ravages of the cholera, which lately visited them in its passage up the coast. Many fled to the islands, but the disease followed them, and many fell victims to it. I mention the following incident that occurred during our stay here, since it will tend to throw some light on the character of these tribes, who are so little known.*

On our second visit the cholera was at its height, and many were daily swept off. When we anchored, the surgeon left the ship in order to afford them medical assistance. On landing he was conducted to the village; he had not been long seated in one of the huts, before an emaciated African boy staggered in through another entrance, and reeling towards him, fell at his feet in the sand. A group of Arabs were seated around smoking with great tranquillity, but none advanced to support or assist him. On noticing with some indignation their inattention, they replied, "that his master had died the day before, and that as his destiny was now about to be fulfilled, no human aid could avail him." In this state, therefore, they had permitted him to crawl from hut to hut, perfectly naked, without food or attendance, under an impression that death would soon release him. It may be conceived, the surprise with which they viewed the means which the surgeon resorted to in order to lessen his sufferings or aid his recovery, and listened to the injunctions that were given relative to his future treatment. The surgeon continued to visit him during our stay, and on our departure he was left in a convalescent state, with provisions and everything necessary for his recovery; and the Arabs, who were still at a loss for a motive to account for the interest we had taken in him, were strongly enjoined to take care of him. In a subsequent visit we learned that the lad, to the great astonishment of the Arabs, had gradually recovered, and was perfectly restored to health. To this incident, which speedily became known along the coast, we were probably in some measure indebted for the little molestation we met with during our stay on it.

If we call to mind the character of the Bedouin, his ignorance of, as well as his negligence in the observance of the doctrines of the Koran, it will not fail to excite some surprise that he should here have retained, in its full force, one of its most irrational doctrines.

Some reports were brought to us during this visit, concerning a

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* The Joheïnah is one of the most celebrated Arab tribes, though little heard of in modern times.

ruined town on the main, and an officer was therefore despatched from the ship to ascertain the fact. The boat landed at a small indenture in the reef which here encircles the coast, near a Bedouin encampment. The beach was low and rocky, but adjoining it there are several high detached masses of light-coloured sandstone rock, which contrast in a singular manner with the dark, more distant, and still higher ranges in the interior. The encampment consisted of about 150 huts ranged in a double line in circular form, with their goats and sheep (it was near sunset) in the middle. Several dogs, resembling the English mastiff, were watching the flocks. These huts differ in form from those of the northern tribes.

The Bedouins here received us on landing with great suspicion, and did not appear to relish either our visit or the questions we put to them.

From the abundance of water on this spot, and the appearance of the soil, there can be but little doubt that it would amply repay the inhabitants for any trouble they might bestow on its cultivation; but the aversion of the Bedouins to tillage is well known, and, with the exception of date-trees, there is scarcely anything else they will take the trouble to rear.

The encampments of the Joheïnah tribe do not extend beyond this. Here they border on those of the Bilí.

In our progress from Hasání to some shoals to the southward, I observed that the Arab mariners have a practice of turning up large portions of the reefs, which, becoming in the course of time blackened by exposure to the atmosphere, serve to point out the different anchorages. From that part of the coast opposite to Hasání to the southward, as far as Rás Mahár, the land fronting the sea is low and sandy in some places, and more elevated and rocky in others; from thence it gradually rises to the height of from 100 to 200 feet, forming at that elevation an extensive table-land. The face of this slope is intersected by numerous traces of torrents, which have divided and rent it in a most extraordinary manner.

The back range, at the distance of about fifteen miles from the sea, takes the same direction as the coast, and is of irregular height, varying from 1500 to 2000 feet. It is broken into detached hills of a pyramidal form, diverging to a considerable width.

Rás Mahár,* the termination of a tract of table-land extending from the southward, is about eighty feet in height; the upper part overhanging the base very considerably. It has a small patch of rocks extending off it, under which the native boats sometimes seek a precarious shelter from strong southerly breezes; but as

* Mhar (Niebuhr).

these winds shift suddenly to the northward, without any warning, and as it has no protection from that quarter, it is never used but in cases of necessity. A short distance to the southward of this cape there is another bluff, formed in a similar manner, and elevated about eighty feet above the land forming the cape.

The interior of the inlet called Sherm Mahár is not very extensive, yet the entrance is capacious, and affords a facility of egress which is rarely met with in other inlets along this coast. Fronting this sherm there is an extensive valley which spreads out to a considerable width as it advances into the interior. The lower part of this is covered with bushes, and along it, at about a mile from the beach, there are some straggling dúm-trees.* Near this spot there are some wells of very indifferent water, and about 200 yards to the right there are traces of a Bedouin encampment. These Arabs are of the Joheïnah tribe, and are very friendly. They supplied us with several sheep, taking rice in exchange.

This valley presents an extraordinary appearance, not unlike the dry bed of a river; the upper part of the hills or banks on either side project very considerably, so that many large fragments have been detached as if by the rush of a torrent, and lie scattered about in the valley. So perfect was the resemblance, that at first sight we found it difficult to assign it to any other cause than this; but on a closer inspection we found that the wind had blown away the soft sandstone of which the lower part is composed, and left the upper stratum, which is harder, until, by their own weight, the masses separated from the body of the hill.

Sherm Hoseï.†—The entrance is clear and capacious. About a mile from the beach, in a north-easterly direction, there are some wells of very indifferent water. In consequence of this deficiency, the Bedouins do not remain here; but when boats are detained for two or three days by contrary winds, these Arabs, who discern their arrival from the hills, frequently bring sheep, water, and other supplies for sale. The limbs and bodies of many of the Bedouins we saw here, were marked with large scars, produced by the application of hot irons to the skin. This is a remedy in great repute with them, in rheumatic and other local affections. In addition to scars of this nature, one man bore on his cheek, just below the eye, the mark of a deep incision which had been made in order to counteract the ill effects of the bite of a snake.

Rás Barídí is that projecting part of the coast which branches out into several low and rocky points. The most southerly of these, called by the Arabs Rás-el-'akík,‡ is what has been taken

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* Cucifera Thebaïca, the bifurcate or forked palm.

† Hœssej (Niebuhr).

‡ Ruby cape: it is pronounced Rás-el-agíg, káf being sounded like *g* by the Bedawís. See Burckhardt's Arabia, p. 466.

by many navigators as the true cape, but several apply the same appellation to a low point named Rás-Jerbó'ah,* to the eastward of the former, which has an extensive reef running off from it. In the western part of a lagoon formed by this reef, and a range of low sandy islets, which, for the distance of a mile, runs parallel to it, anchorage may be obtained. Within this range of islets, the Palinurus anchored, the Cape Rás-el-'akík bearing west by south, half south, distant about seven miles. The pilots are well acquainted with this part of the coast, from its being frequently visited by their bagalós. I observe that the anchorages are generally met with about 200 yards inside any of the islets, which are in fact merely ridges or labyrinths of reefs, connected together by an extensive bank of soundings. The coast abreast of the islet under which we anchored was low and sandy: the first range beyond this, consisting of sharp conical hills, terminates to the northward by a bold and remarkable-looking cliff. To the southward, detached from this range, there is a singular hill, the upper part of which rises in pointed and rugged elevations. It is marked in Sir Home Popham's chart as a "scragged hill." It may be seen ten miles to the southward of Yembo', whence it appears detached from the main. Still more to the southward, between the beach and the Radwah range, there is a group of dark-coloured hills, elevated generally about 500 feet. The valleys between these are filled with light-coloured sand, which appears to have been driven up from the surrounding desert † by the strong westerly breezes. The same appearance is observable in the Sea of Suez, and on other parts of the Arabian shore. The coast continues of the same character from this point to Sherm Yembo'.

Sherm Yembo'.—This inlet is free from all dangers, either inside or at the entrance, which is capacious, and may be easily distinguished. This is incomparably the best harbour on the coast: it has soundings near the entrance, where a vessel, if becalmed, might anchor—an advantage possessed by few others. Sailing vessels apprehensive of entering the sherm may anchor outside, and obtain supplies from Yembo' either by land or boat-carriage. The Arabs are of the Joheïnah tribe, and may be safely trusted.

As Jiddah is considered to be the port of Mecca, so may Yembo', for the same reasons, be entitled the port of Medína; but no parallel can be drawn between the appearance, population, or commerce of these sea-ports.

The population of Yembo', from the influx and departure of pilgrims, like that of Jiddah, is constantly fluctuating; but the number of actual residents, including 500 Turkish troops, may be

* Dsjabra (Jabrah) of Niebuhr.

† Are the western breezes strong enough to carry the sand across the Red Sea, here nearly in its greatest width?

estimated at 2000. Its commerce is necessarily of minor importance to that of Jiddah. No ships resort to its port, and the trade is therefore carried on solely in boats. They have now about seventy, many of which are engaged in the conveyance of pilgrims and their merchandise between Jiddah and Suez.

The town is situated on a low, sandy spot, which is utterly destitute of vegetation. There are about 1500 houses, occupying a space of great extent. Encompassing these there is a wall, tolerably constructed, about twelve feet in height, pierced with loop-holes near the top, for musketry. At each of the angles formed by this wall, irregular octagonal buildings have been erected, which serve to flank the sides, and those on the sea-front to protect the harbour. In this quarter there are numerous breaches in the wall. This portion of the wall appears to have been constructed at an earlier period than the rest, and is consequently in a more ruinous state. Many of these breaches have apparently been purposely made to facilitate the communication with the boats, so that at high water the sea, which washes some distance above the base, is partially admitted through them into the town. The towers also are so much dilapidated, that the town might easily be entered through the embrasures, which are not above three feet from the ground. When their guns (two or three in each tower) are not used, the garrison keep these openings closed by wooden shutters. This wall and its towers constitute all the fortifications of Yembo'.

Many of the houses, which are built of coral, are in a ruinous condition, and others are rapidly falling into decay. In construction they differ from those of Jiddah and Mokhá, by having, with a few exceptions, all their apartments on one floor, and by being more rudely and coarsely constructed. The streets are confined and dirty.

The inhabitants are mostly Arabs of the Joheïnah tribe; the other residents are merchants, descendants of Mussulman Indians, who have settled here, and who alone engage in trade; but neither Banians nor Jews are permitted to reside either here or at Jiddah.* The latter are numerous in the lower part of the coast, as are the former at and to the southward of Mokhá. The Arabs do not reside here permanently; the greater part of the year is passed among their date-groves at Yembo'-Nakhl,† where they have houses and gardens. They adhere with much tenacity, even in the town, to the primitive simplicity of their Bedouin habits, and consequently are seldom found engaged in commercial pursuits. Few appear abroad in the street unless in their full Bedouin

* Jiddah was till very lately almost the only place in Hijáz, the holy land of the Moslims, accessible to unbelievers.

† That is, Yembo'-date-palm.—Ed.

costume, with their matchlock slung by a leather belt at the back, their sambír,* or crooked dagger, with one or a brace of pistols highly inlaid and ornamented with silver, in their girdle; and those who can afford it, a long crooked sabre, double-edged near the point, by their side. The camaline,† as it is styled in the Persian Gulf, or 'abá, is worn here by all classes. The keïfiyet‡ is also constantly worn in Yembo'. It is a broad kerchief, striped green, red, and yellow, having the sides hanging down, with knotted strings appended to them, serving by their motion to keep off the flies, which are here excessively troublesome.

The women had their faces totally covered by a veil of coloured but transparent muslin; and their persons were likewise enveloped in a loose wrapper of blue cotton, which covers the head and shoulders, and extends down to the feet. The females of Yembo' have the reputation of being fair and handsome.

During our several visits to this port, the inhabitants behaved with great civility, in all probability regulating their line of conduct agreeably to the known good-will which the Páshá entertains towards Europeans. Whenever the officers of the Palinurus landed, they were permitted to roam about the town without being made sensible, either by importunities or questions, that this liberty was granted as an indulgence, or that their steps were watched. It is amusing to contrast this fact relating to the people of Yembo', with the picture which has been given us by Irwin and Bruce of its ferocious and treacherous inhabitants. The pigs we had on board excited more attention and curiosity than the ship, though no European vessel had visited their port for many years before.

The revenue of Yembo', like that of Jiddah, arises exclusively from the customs, which are nominally fixed at ten per cent.; but great irregularities prevail in collecting them, some articles being charged at a higher and others at a lower rate.

Merchandise imported from Jiddah pays no duty, if a certificate be produced from the custom-master of that port, that the dues have been paid there. An officer is placed at Suez on board each boat bound to this port, to prevent smuggling, which, during the sheríf's time, was carried on to a great extent. Customs are levied at the same rate on dates, butter, and other provisions; many of the boats visiting this port take away large quantities of provisions for the Jiddah-market.

The imports, which consist of articles required for the con-

* Unless this is a local term, it is probably a corruption of sanbúr, "a tube," or the Persian word shamshír, "a sword."—Ed.

† This seems to be an adaptation of the Indian word *kamalí*, or *kamlí*, "a woollen wrapper or blanket." The 'abá of the Arabs is much the same thing, but usually striped black and white.—Ed.

‡ Literally "convenience, comfort."

sumption of Medína, Nejd, and the northern parts of Hejáz, are mostly grain, coffee, and articles of dress; the latter, till within the last few years, were supplied from the India-market by the way of Jiddah, but Mohammed 'Alí, from causes that will subsequently be more fully explained, obliged the Yembo' merchants to purchase the manufactures of Egypt at his own price, and does not permit the importation of any Indian commodities under the severest penalties. So rigorously is this regulation enforced, that any cloth not bearing the Páshá's stamp, worn within the walls, is seizable.

The Páshá likewise holds the entire monopoly of grain, which the merchants are obliged to purchase at his own price, and content themselves with retailing it to the Bedouins at a moderate profit.

It is only when the communication with the interior is interrupted, that Medína and Nejd are exclusively supplied with grain and coffee by the route of Yembo'. When the road is open, as it is at present, a considerable quantity of both articles is conveyed by caravan from Yemen to Medína.

At the period of our visit Yembo' was garrisoned by 500 Albanian troops, who were relieved at stated intervals by others from Medína. The situation of governor, whose office is to superintend the landing and forwarding of grain to that city, and the fulfilment, on terms the most advantageous to the Páshá, of Mohammed 'Alí's various agreements with the respective Bedouin chiefs in the vicinity of Yembo', is an appointment of some importance, and a source of emolument, though the salary he receives from the Páshá is said to be only 500 dollars per mensem.

Shortly after our first arrival, Captain Moresby received a visit from a Bedouin chief of the Sheríf's tribe, named Serúr. His power is acknowledged from the confines of the possessions of the tribe of Harb, a few miles to the southward of Yembo', northward as far as Hasání. They still acknowledge a superior in the Sheríf of Mecca, who, though deprived of the power and importance which was formerly attached to his high station, and now a mere tool of Mohammed 'Alí, still holds a moral influence over all the Bedouin sheïkhs in Hejáz.

Serúr appeared to be about forty years of age, of a tall commanding figure, rather inclining to obesity (an unusual circumstance in an Arab), with bold, frank, engaging manners. We were anxious to obtain his permission to visit the mountains of Radwah, about twenty-five miles distant from Yembo', and he readily gave it, with the promise of an escort; but so many impediments arose from the jealousy of the Bedouins, who became acquainted with our intentions, and who could not be made to comprehend that our observations on the state of their country were not preparatory

to taking possession of it, that we were obliged to leave Yembo' without effecting our purpose.*

Bruce states that on the summit of these hills, in addition to the finest climate in the world, " all sorts of Arabian and African fruits grow to perfection; that it is the paradise of the people of Yembo', those of any substance having country-houses there," &c. This information there is no doubt he received from the Arabs, for no mention is made of his having proceeded to them. Accounts nearly as exaggerated were furnished us, but there is great reason to doubt their correctness. If true, it would appear somewhat strange that none of these productions should have reached Yembo'; yet, during our stay there (at nearly all seasons), neither vegetables nor fruits of any description were exposed for sale in the market, nor, from particular inquiries, could we learn that, at any season, they were brought hither, even for the governor.

The same feeling of jealousy that prevented our journey to these mountains, also operated in frustrating an intended visit to Yembo'-Nakhl. It is there that the Arabs have their country-houses, and not on the Radwah hills, as Mr. Bruce was incorrectly informed. From what we could learn from the Arabs, this tract lies in a north-easterly direction from the town, at the distance of fifteen miles, and is situated at the base of a range of hills, from which a stream of water issues. Few vegetables are cultivated there; a small quantity of dhurrah and tobacco is grown, but the attention of the Arabs is almost exclusively confined to their date-trees, the produce of which is much esteemed. Among these groves the houses are scattered, which are occupied by distinct families; these houses are constructed of stone brought from the neighbouring hills, and are said to pass from father to son, being never given up by the family to which they belong.

Before Mohammed 'Alí's rule, quarrels were as frequent here as they are in the wildest parts of the desert, and the destruction of their date-groves was an event of by no means unfrequent occurrence; but since the Páshá now derives a considerable revenue from the produce of their date plantations, it has become an object of interest to prevent the recurrence of these disputes, and a force is constantly stationed here.

As Ptolemy places Iambia † near this spot, it is much to be regretted that we were not enabled to visit it, since some interesting remains might possibly have been discovered there. It is somewhat singular that the Arabs of Yembo'-Nakhl should to this day consider Yembo' as a colony, or as merely a temporary residence.

* Perhaps a dread of seeing the sacred soil polluted by infidels was the true cause of these impediments.

† Lat. 23° 50', long. 68° 30', in the Greek text; in the Latin version, lat. 24°, long. 68° 20'.

The inhabitants of Yembo', from the scarcity of springs, are obliged to collect the rain-water for the use of the town, which is preserved in reservoirs. To effect this, the method they have adopted is simple; a low spot, to which watercourses naturally lead, is selected, and a tank is then sunk; its sides are well lined with cement and the top roofed over. But should, as is the case about once in six years, little or no rain fall during the season, the inhabitants obtain a supply from some wells about an hour's journey from the town. The scarcity of good water is not so great in this part of the coast, as throughout the shores of the Red Sea generally.

Locusts are sold in the markets of Yembo', and also at Jiddah; they are considered wholesome and nutritious.

In addition to most excellent water, which is so cheap that the Hajj boats always fill here, in preference to Jiddah, fowls and sometimes bullocks may be procured here, but no vegetables.

The difficulty of egress, which can only be effected by a southerly or land wind, is a disadvantage which the harbour of Yembo' labours under, in common with many others on this coast.

It has been already noticed that this part of the coast on which Yembo' stands is low and sandy, but in the interior there are hills of considerable elevation; the bold and lofty range over the town, called by the natives Jebel Radwah, but more generally known to navigators as the "Yembo' hills," is a collection of mountainous ridges which run nearly parallel to each other, and terminate in broken and rugged peaks; their general direction being nearly north and south, and the ranges being nearly of the same height, while following the direction of the coast, which runs more to the eastward and westward.

From the town of Yembo', which may be seen at the distance of six or seven miles, the coast line to the southward as far as Sherm Bareïkah is low, marshy, and thickly overrun with mangrove-trees.* Yembo' is principally supplied with firewood from this tract; the trees are felled, and permitted to remain in the sun until they are perfectly dried. It is somewhat singular that boats in passing do not appropriate some of this wood to their own use, or convey it to this port for sale; but I am told that, notwithstanding no one is left in charge of it, a robbery of this nature is never known.

Beyond this marshy tract the country continues low for a considerable distance, and as it recedes from the shore appears to be composed of a light fine sand, which has filled up the valleys and blown up the sea faces of the numerous hills that rise in sharp conical peaks. Though several of these are from 500 to 1000

* Rhizophora (i.e. root-bearer) Manglé.

feet in height, yet the sand has collected in such prodigious quantities as to reach the summit of the most elevated, leaving in many places the upper parts of the black peaks discernible, and from thence descending in a solid mass, with a moderate inclination to the plain.

Sherm Bareïkah has a narrow entrance, not more than fifty yards wide; but as the water in the channel is perfectly smooth, and the rocks on either side rise perpendicularly, the passage is unattended with danger. From this narrow gut the interior swells out into an excellent harbour, of sufficient extent to afford anchorage in three or four fathoms for five or six ships.

With the exception of a narrow channel for boats on the northern side, the upper part of this sherm is choked up by an extensive flat, which is dry at low water. This channel leads to a low point on which we discovered the ruins of a town* as large as Yembo', extending about a mile in length and half that space in breadth; a fort has been erected in the vicinity. The remains of the fort show it to have been of a square form, with towers at the corners and gates. Near the middle, on either side, the walls are high and six feet in thickness; so that, in a country where the use of artillery is almost unknown, it must have been esteemed a place of great strength. The ruins of a jetty of solid masonry are visible near the landing-place. At the distance of 100 yards from this there is a quay paved with hewn stones; of these pavements there are four circular spaces nine feet in diameter. We partially excavated one of the houses among the ruins, but found nothing more than shapeless masses of corroded copper and brass, and fragments of broken coloured glass and earthenware, apparently of the same description as is found scattered over the ruins of Egyptian towns. An examination of these might possibly lead to a discovery of the period at which this town was erected; the glass I observed to be more opaque than that at present manufactured.

The Arabs could afford us no information on the subject of the origin of this town, yet it has evidently been a place of great strength, if not of considerable commercial importance. The existence of a jetty and quay would induce us to suppose that vessels, by means of the channels, must have formerly found sufficient water to permit them to pass up and deliver their cargoes at the town. About a mile from the fort the ruins of another town, which has been constructed of coral, now much blackened by exposure to the atmosphere, are visible; and on the other side of the sherm, opposite to the low point, there are also extensive ruins, but the jealousy of the Bedouins prevented our making any particular examination of these.

* Jár er El Jár, in 23° 36′ N. by Niebuhr's observation. Geogr. Nubiens, p. 109.

Supplies may be obtained here, but great caution should be exercised in treating with the Bedouins from whom they are procured. They belong to the Harb tribe, who bear the character of being subtle and ferocious. During our stay, after purchasing several sheep from them, they made a ridiculous demand for money as a port-due for entering their harbour, which was of course refused. On this they seized the pilot who was on shore, and one of the party, eager to commence a fray, attempted to shoot one of the boat's crew. A message had been brought off previous to this by one of the pilot's sons, to the purport, that we had no right to be making observations and erecting flags on their coast, and they would immediately drive us off it, but that our great guns gave us an advantage over them. If, they added, we would dispense with these, and come on shore, they should be happy to meet us on equal terms. Though we laughed at this challenge, it was deemed necessary to watch their motions, and this act of violence was fortunately observed from the ship. A gun was immediately got in readiness, and a shot or two were fired over them, which sent the whole party scampering off. It was amusing to observe other groups who, having seen us visit the ruins in the morning for the purpose, as they supposed, of obtaining treasure, had been patiently awaiting our second approach, to detain or perhaps murder us. This party sprung up in all directions from the hillocks and bushes, where they were concealed, and joined in the flight.

Five miles to the southward of Sherm Bareïkah, under a low sandy cape called Rás-er-Reïs, lies Mersá Sabír. It is a safe, commodious, and extensive anchorage, capable of receiving any number of vessels.

Jebel Sub-h * is a mountain remarkable for its magnitude and elevation, which is greater than any other between Yembo' and Jiddah. Its summit is the stronghold of a fierce and warlike race of Bedouins (a branch of the great Harb tribe), who are called Bení Sub-h, who inhabit its fastnesses, and are divided into smaller tribes who rove about in its vicinity. Several of them were pointed out to us at Sherm Bareïkah. The numerous passes by which these mountains are approached have been successfully defended against the Wahhábís during their late irruption, when the whole of Hejáz submitted to their arms, and the Bení Sub-h alone † boldly asserted and maintained their independence. Their territory afforded shelter to such of the neighbouring tribes as, with their families and property, were willing to seek their pro-

* Sub-h, or Sob-h. See Burckhardt's Notes on the Bedouins p. 236. Jebel-es-es-sob-'h signifies the Mountain of the Morning; it lies to the east of Bedr, and is famous for producing the balm of Mecca.—Ed. (Niebuhr's Descr. of Arab., p. 357.)

† Not with ultimate success. See Burckhardt's Hedjaz, p. 308.

tection. The national independence of Arabs has been much talked of, but I question if these be not one of the few tribes that have never known a master. At two passes in the route of the caravan, called Safrá and Jedídeh,* they were less successful. After a long resistance they surrendered to Sa'úd. It may be remembered that it was against the latter of these passes, when in the possession of the Wahhábís, that Tusún Páshá received a severe defeat in 1811. The Arabs permitted his troops to occupy the pass, and then destroyed them with musketry and rocks hurled down on them from above.

For the free passage of the Egyptian caravan Mohammed 'Alí treated at the conclusion of the war; and though he still furnishes them with an annual present, a large sum is nevertheless exacted from the Syrian hajj on this spot, before they are permitted to pass the defile.

Their principal sheïkh, Sultán ben Hasan, has, for greater security, fixed his residence near this spot. Possessed of great personal strength and undaunted courage, the fame of this chief as a warrior furnishes a general theme of discourse among the neighbouring tribes. These qualities, joined to an intriguing disposition and considerable political talent, have rendered him the most powerful chief in Hejáz. Several ineffectual attempts have been made to draw him into the power of the Páshá, but Ben Hasan continues to elude his artifices and his threats. The dominions of the Harb tribe extend from hence to Jiddah, the Zobeïdeh † and Tuwál being merely branches of this. Their force is calculated at 50,000 matchlocks, which marks them as the most powerful tribe in Arabia. Their habits are predatory and warlike, and their disposition bold and sagacious. In appearance they are taller and more fleshy than their neighbours of the plains, but in the form and expression of the face no difference is discernible. They are alike the objects of dread and suspicion to the pilgrims, to the mariners who visit the coast, and to the neighbouring tribes. They appear to be equally shunned or feared by all. Amidst the mountains, which furnish an abundant supply of fresh water, they are rich in their own resources, possessing numerous flocks of sheep, rich pastures, a considerable quantity of corn, which they compel their slaves to cultivate, and extensive date-groves.

The measures which the Páshá has successfully adopted as the means of quieting the other tribes, by stopping the supply of grain, would therefore lose their effects on these.

Within their territories we met them more frequently near the sea coast, than any of the other tribes. Camels, huts, and men

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* Es-súk el-jedídeh, "the new market." See Burckhardt's Hedjaz, p. 312.

† Burckhardt (Bedouins, p. 237) speaks of them as unwarlike. The number of the Harb here given is probably exaggerated.

were observed whenever we approached the shore, and on one occasion, near Rás Mastúrah, an officer was compelled to quit a station which he occupied near a few huts, by their sounding the alarm and gathering in great numbers on an adjoining hill, with the evident intention of attacking him. It would, therefore, be highly imprudent to encounter them by landing at any of the intermediate ports between Yembo' and Rábegh.

Sherm Rábegh is well known as the halting-place on the route of the caravans between Yembo' and Jiddah, and also as the boundary of what is strictly considered holy ground, in acknowledgment of which pilgrims on their arrival from the northward adopt the ihrám. The quantity of dates produced in the groves in its vicinity is more than sufficient for the consumption of the cultivators, and the surplus is therefore appropriated to the purchase of the other necessaries of life. During the date-season, from the commencement of July to the latter end of September, an annual fair is held here, to which the inhabitants of the neighbouring parts resort in great numbers, exchanging for this surplus their salt fish, cured on the coast, and their grain, cloth, &c., procured from Jiddah. These articles are retailed again to the Arabs of the interior, so that the whole of the Harb tribes are supplied from this port with the few foreign articles which they require. Many others, attracted also by the cheapness of the food, reside here during these months, on the profits obtained from their fishing and the pearls they may have collected, returning at the close of the season to their former occupation. It was computed there were 5000 men here when we arrived in August. At our second visit, in September, there were not more than a fifth of that number.

Harámil* Island, about two hundred yards in length, is merely an accumulation of drift-sand on the upper ridge of a reef. It is elevated about ten or twelve feet, covered with high bushes, and may be discerned about eight miles off. Nearly opposite to this island, on the main, there is a Bedouin village called Tuwál. It contains about two hundred inhabitants, who subsist by fishing and the collection of pearls. Of the latter, the northern part of the Red Sea furnishes but a scanty supply, and they are inferior, both in size and quality, to those obtained from the extensive banks in the Persian Gulf. Probably the most convincing proof that can be given of the insignificance of this trade here is, that it has escaped the notice, or is deemed unworthy the attention, of the Páshá's officers. A few boats are occasionally dispatched by the Jiddah merchants for this purpose, but the precarious and ill-paid task of collecting them here is left mostly to the Tuwál and Huteímí

* The plural of Harmalah, the Peganum of Linnæus. Haram in Niebuhr's map; omitted in his text.

tribes. The former have about forty boats engaged in this trade, which are mostly employed on the Abyssinian coast.

From hence to Sherm Ub-hur, or Charles Inlet, the coast continues low and sandy, intersected by numerous inlets and creeks affording excellent anchorages, but rendered so difficult of approach from the numerous sunken rocks, reefs, and sandbanks lying off the shore, that it is not probable they can be made available for any useful purpose. The high land at the back presents nothing remarkable in its appearance.

Sherm Ub-hur,* or Charles Inlet, is about eight miles in length, varying in breadth from a quarter of a mile to 150 yards. Its extremity is connected with a marsh which extends, by the report of the Arab, several miles into the interior. The river Betius of Ptolemy is marked in D'Anville's map, as having its outlet in this bay. We explored its termination, but there is nothing which would induce us to suppose that it receives any other supply of fresh water than an occasional torrent† from the interior. The anchorage is upon the northern bank, about half a mile from the entrance, and about 200 yards inside a rocky point, which should be rounded as near as the patch running off it will admit. With the exception of this point, the extremity of which may be easily discerned, the passage inside, as well as the coast about the entrance, is free from dangers.

A range of barren and naked mountains (being a part of the great chain which nearly encompasses Arabia) extends from Jiddah to 'Akabah, approaching in some few places near the sea coast, and running towards the interior in ridges increasing in height as they recede from the sea. In clear weather these hills are visible at a distance of from forty to seventy miles. The highest hills of this range are Jebel Sub-h, Jebel Radwah, and the Mowilahh peaks, which I have particularly described. So little variety marks the appearance and form of the others, that I have rarely deemed it necessary to enter into a detailed description of them. Of the character of the distant ranges we had little opportunity of judging, further than, by their rugged and pointed appearance, we may be inclined to conclude them to be of granitic formation; those near the fort at Wej-h (the only occasion on which we could venture so far into the interior) were observed to be of dark granite, with veins of white quartz running horizontally through them. Many of the hills nearer the shore are of limestone, exhibiting an almost entire mass of marine fossil remains; those bounding the sea-shore are of light coloured sandstone, fronted by, and containing large quantities of shells and masses of coral. The extraordinary prevalence of the latter in the Red Sea

* In 21° 41′ by Niebuhr's observations. Description of Arabia, p. 357.

† Probably the Betius was such a torrent.

is well known; it is found constituting reefs, probably as extensive as in any other part of the world; it also enters largely into the composition of some of the most elevated hills.

Between the bases of these hills and the shore, there runs a border of lowland of irregular width, which the Arabs call Tehámah. It is generally desert and barren; some few spots are cultivated, but they bear so trifling a proportion to the whole, as to be unworthy of notice in these general remarks. The coast line to the northward of Yembo' is of moderate elevation, varying from 50 to 100 feet, with no beach. To the southward of that part it is more sandy and less elevated; the inlets and harbours of the former tract may be styled coves, in the latter they are lagoons. We observed in all those indentures that a valley (the lower part of which in some cases bore evident traces of having been the bed of a torrent, and in all exhibited signs of the former existence of fresh water) led from the interior and opened into them. It was, therefore, surmised, that the water brought down by the torrents had either destroyed the coral which formerly existed in the situation of these openings, or prevented its formation.

To the southward, from Yembo' to Jiddah, the coast, consisting of sandbanks with coral bases, is lined with reefs, which run nearly parallel to the shore, with which they are in many places connected. The inlets, or, as they are styled by the natives, sherms, are pointed out in the charts; but, from the nature of the coast, it would be difficult, if not impossible, to distinguish their entrance without the assistance of a pilot. To the natives, therefore, they compensate in some degree for the deficiency of other anchorages; and they are so situated in respect to each other, that they form convenient halting-places for the boats and vessels in their progress up and down the sea. In some intervals they do not exist, and the Arabs are, under these circumstances, constrained to depend on the precarious shelter afforded by the reefs. The importance of these inlets, should small steamers pass by this route, is evident; and the facilities they afford of procuring fresh water, provisions, and firewood, may prove an inducement for ships proceeding up outside to visit them.

The reefs in this part of the Red Sea are found either extending in ridges, which have generally deep water or no soundings near them, or they form extensive banks, which have a depth of from ten to fifteen fathoms water over them.

With some few exceptions, their general direction is straight, though, in many places, the short projections on either side give them a serpentine appearance. Their length varies from 150 yards to two or three miles, which they rarely exceed. It may be remarked that, under every variety of wind or weather, in no instance did we witness heavy surf on the reefs. If I might hazard

a conjecture on this fact, it is, that the cause of this absence of surf must be looked for in the coral being more porous on the outer part of the reefs; this part being composed of the branched variety, by which the force of the sea may become broken in the same manner as that of a body of water would, if dashed against a sieve.

But be the cause what it may, it is of practical importance that the mariner should be made acquainted with the fact; for in standing towards those reefs at night he may be lulled into false confidence, and border too closely on them, under an impression that he would either hear or see the surf. In the neighbourhood of, and amidst the clusters, a chart can avail the mariner no further than in marking the outer boundary, to which our attention was therefore especially directed; within this the navigator must be directed by the eye, as the only and the best pilot, and a short acquaintance with this manner of proceeding, will enable him to distinguish the dangers, and also to estimate from the various shades the changes in the depth of the water.

During the warm season, from May to October, in the northern part of the sea, the reefs are observed to have about two feet less water on them, than in the remaining months of the year. This effect is produced by the influence of northerly winds at this season, which, prevailing throughout the whole extent of the sea, cause a continued current to set through the Straits into the Gulf of 'Aden. When the southerly winds, which at the lower part of the sea prevail from October to May, set in, these currents are observed to change their direction, and to flow back with rapidity: the whole body of water having no means of escape, then collects towards the northern part of the sea, and becomes considerably elevated. The partial influence of a southerly breeze during the former months was observed to produce for a short time a similar effect, the water subsiding to its former level on the return of the northerly breezes.

It is a question of importance to determine whether it would be practicable for a small steamer, when prevented by northerly winds from pursuing her course by the middle channel, to effect the passage up the sea by the channel between the line of reefs and the coast.

A glance at the chart will point out that, with the exception of occasional gaps, a continued line of reefs runs nearly parallel to the shore, and extends along the whole of the Arabian side of the sea. In the interval formed by the outer boundary of the reefs and the line of coast, there are innumerable detached coral rocks and banks, all having between them deep channels, which are constantly traversed by native coasting vessels. Now it is well known that, within these channels, smooth water is always found;

and, near the shore, land and sea breezes often prevail, when hard north-westerly or southerly winds are experienced in the middle of the sea.

Such a remarkable influence have these banks in retarding the progress and lessening the power of the wind, that a breeze from seaward has frequently been observed to linger for nearly an hour at one of these ridges before passing over it; and, near the coast, we have been often running along with a fine land wind on one side of a reef, and have observed a fresh sea breeze prevailing from a contrary direction on the other.

The objections, therefore, that present themselves against the adoption of the inner passage are—

1st. That the vessel must anchor every night.

2nd. That the numerous rocks would render it more dangerous than a passage outside.

This track, however, would only be pursued during the prevalence of strong contrary winds, when much coal would be consumed, and little, if any, progress made in attempting the middle passage. By running along the inner channel at such intervals, she would avoid the heavy swell as well as the continued drain that invariably follows the direction of strong breezes in this sea, and would probably make a progress of fifty or sixty miles a-day.

With reference to the inner passage being attended with more danger than the other, I must admit that it is not easy on a first view to divest ourselves of the idea of danger, which is constantly connected with the proximity to rocks; but, on the other hand, the clearness of the water in this channel will enable the navigator easily to distinguish and avoid the rocks, especially with a steamer.

Provided she should be unfortunate enough to strike against the rocks, it by no means follows that she would be certain of receiving material injury: such accidents are of frequent occurrence with the large bagalós, some of 200 tons, that are of very slight construction; India-built ships have in this respect a decided advantage. From Jiddah upwards, along the Arabian shore, the practicability of effecting the passage by the inner channel has been proved, the Palinurus having twice pursued that course without accident.

Climate.—Though the sea-coast of Hejáz is pronounced unhealthy, yet, afloat, we did not find it so. Among our crew, consisting of twenty-five Europeans and forty-five natives, not a fatal case occurred during our stay there. The temperature, compared with that of the Persian Gulf, is moderate; near the sea-coast, where the winds are light with intervals of calm, it is usually much warmer than in the middle of the sea, where there is rarely any intermission of the prevailing breezes.

The north-westers are cool and refreshing, but the southerly winds are damp, sultry, and unwholesome. During the period at which the latter prevail, in September and October, the dampness of the air is very great in the warmest days, and the heavy dew at night, when all are obliged to sleep in the open air, render it particularly disagreeable. The sudden and grateful change which a return of the north-westerly breezes produces in the atmosphere, renders them particularly desirable at this season.

Though the béri-béri* is by no means prevalent amongst the Arabs themselves, yet few ships have visited the Red Sea of late years, without their crews having suffered considerably from the ravages of that fatal disease. Our exemption from it may be mainly attributed to the excellent water which we were enabled to procure during our stay on the coast, as well as to the care that was taken in supplying the crew, both native and European, by every opportunity, with the best fresh provisions. Dysentery, fevers, and ulcers on the legs, are common at Yembo' and Jiddah.

I observe that sickness to a considerable extent generally prevails during the hajj season on the sea coast and at Mecca. The unhealthy situation of that city, the indifferent quality of its water, and the fatigues of travelling, joined to the dangerous custom of changing the garments unusually worn, for the Ihrám, all contribute towards producing frequent and fatal diseases; yet these are few and trifling compared to the prodigious mortality which has occurred this year (1831), by a visitation (I believe the first on record) of the cholera. That fatal disease had shown itself in some few cases previous to the hajj, and was supposed by the Arabs to have been brought by the Indians, but it was not until the whole multitude had assembled, that it reached its utmost violence. Its virulence became at length so great, that it is computed that nearly one-half of the pilgrims fell victims to it. The governors of Mecca and of Jiddah, the Páshá who accompanied the Syrian caravan, and many other people of distinction were swept off. So numerous were its victims, that the living ceased to bury the dead singly, but dug large pits into which the bodies were thrown by hundreds. Many pilgrims were so stupified at the suddenness of the event, that they were unable to leave the city, while others hastily quitted it, and the road from Mecca to Jiddah was in consequence, for several weeks afterwards, strewed with the dead and dying.

The disease followed the pilgrims in their passage up the coast, attacking the inhabitants of Yembo', Suez, and Cairo, successively; and we found that the halting places of the hajj boats were strewed with the numerous graves of those who fell victims to it.

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* An Indian or Malay word, not therefore the local name for this disease.

In the cold weather the sky is for the most part clear and cloudless; generally speaking, there is no want of rain, which falls in heavy showers during the months of November, December, and January. In this respect the climate of this coast differs widely from that of Egypt, where (though the distance between the two countries is only about 160 miles, the width of the Red Sea), it is well known, rain is of rare occurrence. A season of drought, it is calculated, occurs here about once in four years; the floods during the rainy season pour down from the hills with great violence. Almost every part of the coast bears traces of torrents formed during this season. Fogs are not uncommon at Jiddah and in its neighbourhood, but rarely prevail to the northward of that port.

Of the Inhabitants.—The Bedouins inhabiting this part of the coast differ little in their habits or social condition from those who occupy the deserts of the interior. I observed a considerable difference between the personal appearance of the Arabs of Hejáz, and those bordering on the shores of the Arabian side of the Persian Gulf. The characteristics of the latter are an almost oval face, black hair, which is generally shaven close, eyebrows of the same colour, with a glossy skin, one shade lighter than that of the natives of India. Those near the shores of the Red Sea are lean, but of a vigorous make, and more diminutive in stature. The form of the face more lengthened, their cheeks hollow, and their hair, with the exception of two long curls on either side (on which they bestow considerable care), is permitted to flow as low as their waist. The colour of their skin is lighter. They are generally affected with cutaneous disorders. The expression of their countenance is unpleasing and frequently knavish.

The Bedouins of the sea-coast, like those of the interior, are from necessity very abstemious in their mode of living. A few dates, some salt fish, a draught of water with coffee, constitute their usual food. If to this, on occasions of festivity, a sheep, with some rice or unleavened bread be added, they possess all the luxuries they have ever known. Honey may also be considered as forming one of the principal articles of food with all classes. The bees live in the hollows of the rocks, and feed on the numerous aromatic plants with which the northern part of Hejáz is covered: repeated references to honey are made in the Korán as a wholesome and nutritious food. It was one of the luxuries in which Mohammed indulged. Such is the ordinary fare of those residing in villages or towns on the sea-coast, but that of the Bedouins, who move about with their camels, is more precarious and scanty. I am informed they will undertake a journey of ten or twelve days with nothing but a bag of small cakes, made from flour, mixed with camel's or goat's milk, and a skin of water. Two of the former, each weighing about five ounces, and

a draught of water, the latter twice during the twenty-four hours, form their sole subsistence on such occasions; yet, patiently as they endure this meagre fare, whenever an opportunity offers, they do not scruple to run into the opposite extreme of voracious indulgence.

Their habitations consist of small huts or tents, the former, as at Rábegh, are constructed of coarse grass and flags; the latter, as at 'Aïnúnah, and on the coast opposite to Hasání, of coarse cloths thrown over some sticks, which afford but an indifferent protection against the extremes of heat and cold; the latter, during the winter season, is very severe. In order to obtain shelter against the strong prevailing breezes from the northward, their huts are generally erected behind some hillock, or amidst trees, having also the convenience of pasturage in their vicinity.

Their weapons consist of a spear about eight feet in length, pointed at both ends; a jambír, or large crooked dagger of a semicircular shape, with a broad blade; a matchlock gun, having a barrel of extraordinary length; and sometimes a long sharp double-edged sword. Few, excepting their sheïkhs, appear to possess pistols.

The Huteïmí tribe, branches of which are met with on different parts of this coast, are looked upon by the Bedouins as outcasts*. The legend regarding the cause of their degradation was frequently narrated to us. Mohammed, according to this tradition, in the course of a journey along the sea-coast, sought shelter in their encampments. A dog was prepared for his repast, by which the prophet was so offended, that he pronounced a curse upon this tribe, and enjoined his followers to shun them as a polluted race. They exhibit a more restless disposition than the other Bedouins, and are distinguished from them by their more meagre and squalid appearance. Their food consists almost entirely of fish, which they pick up among the rocks or on the beach. The more wealthy alone, who possess boats, are enabled to procure food of a less disgusting nature. They are so helpless, that they become an easy prey to the Bedouins, who deprive them of any property in their possession, or oblige them to pay a tribute in pearls as the price of exemption from such spoliations. They are to be met with on the Nubian as well as on the Arabian coast.

It was computed that 20,000 pilgrims arrived this year, 1831, from the Egyptian ports. Those coming from Abyssinia, Nubia, and other parts of interior Africa, embark mostly at Masawwah, Suwákin, and Kosaïr, and those from Turkey and the Barbary States at Suez. Constant employment was thus afforded from

* Burckhardt (Bedouins, p. 227) speaks rather more favourably of the Huteïmí tribe.

January to July to about seventy boats belonging to the latter port, and fifty to Kosaïr.

The regulations which Mohammed 'Alí has established at the different ports relative to the embarkation, passage, and disembarkation of pilgrims are salutary and judicious.

The number of passengers that a boat is permitted to take is limited in proportion to her size, which number she is on no account permitted to exceed. Many of these boats make several voyages during the season. To prevent confusion, or the exercise of any undue preference, a register is kept of the pilgrims as they arrive, and they are subsequently embarked in the same order. The amount of the passage money cannot be fixed at any precise sum, since all pay according to their supposed means, but it may among the middle classes be averaged at six dollars from Suez, and four dollars from Kosaïr.

The pilgrims provide their own provisions and water, the former they obtain from the Bedouins at the different anchorages, sheep and goats being brought by these tribes for sale whenever boats are observed to approach the coast; but as they never take more than three or four days' supply of water, great distress is occasionally experienced when the boats are detained by contrary winds, in places where they are unable to obtain this necessary article.

Their method of navigating along the Arabian coast by the inner passage is as follows: they sail after the sun becomes sufficiently high for them to distinguish the numerous rocks with which the channel is studded. At this time they have usually a land wind which enables them to get out of the sherms, and helps them a few miles in their progress along the coast. In going down the sea, as well as in working up, they always anchor about three o'clock in the day, and so little anxiety do they display to arrive at the end of their voyage, that if they have a contrary wind, and towards the close of the day they conceive it will be two or three hours later than their usual time for anchorage, without any hesitation they run back to the nearest point of shelter behind them. After anchoring they never set sail again, even if a fair wind should spring up, but remain very quietly until the following morning. Few, excepting the largest of their boats, drop their anchors or grapnels, but when the vessel approaches sufficiently near to the reefs or the shore, the sail is lowered, and shortly afterwards two or three men jump overboard and secure her to the rocks by hooks, to which ropes are attached. After the vessel is hauled close to the beach, the pilgrims usually leave her, and cook their evening meal on shore. In consequence of the crowded state of these vessels, the confusion in working the boat is very great: the black pilgrims are treated with little consideration, but quarrels are constantly occurring between the Turkish and Moghrebyn pilgrims and the crew.

On these occasions, which are frequent, the dispute is decided by the knives of the former. To avoid the crowd and filth of the interior of the vessel, many of the pilgrims sling their beds, which are similar in construction to the chár* of India, outside the vessel, in which, protected by an awning, they remain during the time the vessel is under sail.

Attached to the caravans, and at the various stations, there are a number of wretched beings, some almost in the last stage of disease, who are solely dependent on the precarious charity of their fellow-travellers, for the means of visiting and returning from the holy cities. To prevent their accumulation at the different ports, where they would probably engender disease, they are portioned out in separate lots by the governors, and the different boats and ships are compelled to furnish them with provisions, and to find them a passage, free of expense, to the various ports to which they may be proceeding. To evade this burden, the honest Nákhodás do not scruple to use every artifice. The poor wretches are sometimes enticed on shore at any part of the coast the vessel may touch, and abandoned there. If the spot is near to, or should happen to be at a port where there is any competent authority, they are placed on board the next vessel that touches there; but if, as is frequently the case, they are landed on some unfrequented part of the coast, the certainty of a miserable death by thirst and starvation awaits them.

As the large boats are not able to approach sufficiently near to the town of Jiddah to land their passengers, those of a smaller description come off as soon as the bagalós have passed the gateway; then commences a scene of wrangling and quarrelling between the pilgrims and these boatmen, for as the latter consider the pilgrims as fair game, they evince an earnest desire to fleece them without mercy.

The unsettled state of Hejáz when Burckhardt visited it, in 1816, induced him to predict that the time had passed away when pilgrims, urged by feelings of devotion, would continue to flock annually to Mecca to visit the shrine of Mohammed. A doubtful war, in which Mohammed 'Alí was at that time engaged with the Wahhábís, could scarcely allow him, in a country like Arabia, to anticipate the long and uninterrupted peace which has followed its successful termination; yet from this cause, the absence of all imposts on the pilgrims, and probably an increasing spirit of commerce, so many facilities and inducements are held out to visit the holy cities, that in 1831 there were more pilgrims assembled there than had been known within the last half century. In 1816, but two of the five or six regular caravans were present; but in 1831,

* Probably the author wrote chár-páï, *i.e.* "bedstead."

the other three enumerated by Burckhardt, viz. the Moghrebyn, the I'rání or Persian, and the Sherkí or Yemen caravans arrived at Mecca, and it was computed that the whole multitude exceeded 120,000 people.

After frequent inquiry, I received the following statement of the number that arrived by sea, which however must be considered as merely an approximation :—

From India	2,000
Malay Coast	1,800
Persian Gulf	4,000
From Suez and Kosaïr—this comprises those pilgrims who arrive from Turkey, Asia Minor, &c., and many from the interior of Africa who sail down the Nile to Cairo .	20,000
From Hodeïdah, Mokhá and the Southern Arabian Ports	3,000
From the Ports on the Abyssinian side, Suwákin, Dahalak, &c. principally poor negro pilgrims . .	2,000

The remainder of those assembled arrived by the caravans.

It will be seen in the preceding part of this memoir, that we obtained as many sheep as we required whenever we fell in with the Bedouins on the sea-coast. These were of two kinds, one white with a black face, and similar to those brought from Abyssinia; the others dark brown, with long clotted hair resembling that of goats. Though small, the flesh of the latter was well tasted.

The Bedouins in the northern Hejáz subsist principally on what they derive by the sale of their butter. This is made from the milk of their sheep and goats. The method of making it is very simple. The milk is placed in goat-skins, and then shaken until the butter is separated.

Bullocks are numerous at Jiddah and to the southward; some are occasionally met with at Rábegh, and even at Yembo', but to the northward we saw none. They are employed in their date-groves for agricultural purposes, and the cows are also valuable for the sake of their milk, but I do not think either the Bedouins or the town-Arabs partake of their flesh, which they consider heating and injurious to their health.

The eagle, the vulture, several varieties of pigeon, the swallow, quail, the red partridge, and another variety are seen in this part of the Arabian coast; wild ducks were shot at 'Aïnúnah, and flocks of flamingos are sometimes seen crossing the northern part of the sea.

We found an extraordinary variety of fish amidst the reefs, and in every part of the coast. In many of the sherms they were particularly abundant. When we could not haul the line, a boat dispatched under sail, with a line astern, seldom returned without a plentiful supply. It may be unnecessary to mention more than that, in common with the fish usually found in the vicinity of coral

reefs, we procured mullet, sardines, a species of pomphlet, cavalls, seer, and king-fish, &c.; the latter are considered by the natives to be very formidable, and are much dreaded by the divers. Sharks of a small species rarely attaining a greater length than six or seven feet, are very numerous on the coral banks; they are not often seen at the surface, but mostly remain near the bottom: they prove very valuable to the natives, and boats are often dispatched for the sole purpose of catching them; their flesh is preserved and sold in the markets at Yembo' and Jiddah, and is esteemed by all classes. Medicinal virtues are also ascribed to some part of the head. Oil of an indifferent quality is extracted from their liver. The process by which they obtain it is very simple: the liver is cut into small pieces, and exposed in bladders to the sun until the whole of the oil has exuded from it. A lucrative trade is also carried on in their skins and fins. The India-ships take them from Jiddah and Mokhá for the China-market.

It was known to the ancients that seals visited this sea. Shadwán was called by them the Island of Seals. They are still seen in the northern part of the sea by the fishermen, who, on several occasions, showed us their skins and tusks. Whales have been seen near Kosaïr; and about five years ago, one was thrown ashore on the island of Senáfir.

The commodities which are now brought to Jiddah from India are either disposed of during the hajj to pilgrims, who again distribute them through Turkey, Syria, &c., or they are such as are required at Mecca, Jiddah, and other cities in Hejáz.

The cargoes of ships coming from Bengal are more varied than those from the other Indian ports. Some vessels arrive direct from Calcutta, freighted solely with rice, sugar, and Dacca-muslin, which may be considered as the staple commodities; others being coarse and fine blue cloths, cambric, of which the ihrám is made, and indigo. Touching on the Malabar coast, these ships fill up with teak-timber, cocoa-nut oil, cocoa-nuts, black pepper, dried ginger, turmeric, &c., and sail direct to the Red Sea. During the last ten years, this branch of trade has been gradually declining, and ships now engaged in it barely clear their expenses.

Ships seldom leave Bombay direct for the Red Sea, unless they are small, and intended for the coasting trade. If they obtain a sufficient number of pilgrims to defray the greater part of the freight, they ballast with sugar; but the usual practice is to proceed to the Malabar coast, where they take in cargoes of the same articles as the Bengal ships, in addition to which they bring annually from the port of Bombay 400 or 500 tons of pig-lead, which is landed at Mokhá, and afterwards disposed of to the Somálies at Berberah.

The imports from Surat consist wholly of Cashmere-shawls,

tissue, flowered and embroidered muslin, and other valuable cloths, amounting, on a yearly average, to the value of six laks of dollars *. Most of these articles are carried by the pilgrims to Constantinople, and a great part is also purchased by the merchants here, and consigned to their agents at Cairo for sale.

From Bushire and Bussora † the principal imports are wheat, tobacco, and Persian carpets. The latter are mostly purchased by the Bedouin sheïkhs, in whose tents one at least is considered as indispensable. From thence are likewise brought the dates of Bahreïn and Bussorah, which are much esteemed in Hejáz; but the profits arising from the conveyance of pilgrims form the principal object of the vessels trading from these ports. The difficulties and restrictions to which the Persians have at former periods been subjected, are now wholly removed; and these sectarians are permitted to visit, unmolested, the birthplace and tomb of their prophet. None but rich Persians, however, perform the hajj, and the sum obtained from them for their passage is consequently very high, varying from 40 to 100 dollars from Bushire, and one-third less from Maskat and Bender-'Abbás. A vessel belonging to the sheïkh of Bushire cleared, this year, 40,000 rupees by her passengers.

From the Malay Islands little other merchandize is brought than spices, which are very generally used in Hejáz. Ships from thence complete their cargoes on the Malabar coast with rice. Numerous pilgrims arrive annually in these vessels. In the transport of pilgrims, and to carry on the limited trade, both of which objects are engrossed by Mohammed 'Alí Páshá, there are four vessels employed; and, notwithstanding the passage-money is fixed at a high rate, they are crowded to excess, from the impossibility of procuring a passage by any other means. Leaving Mokhá for so long a voyage, a small brig of 200 tons had 270 persons stowed on board, exclusive of her crew.

It is a well-authenticated fact, and one which is not generally known, that a number of young females are brought annually to Mecca from those islands for sale. They are disposed of at from 150 to 300 dollars, and are much esteemed both by the natives and the Turks, though the latter are more generally the purchasers.

Independently of the trade carried on in square-rigged vessels, amounting, this year, to 26 in number (about 10,000 tons), there is also a considerable branch conducted in large bagalós, which run during the fine-weather months, between India and the ports in the Persian Gulf and the Red Sea.

The returns made for these imports to the various ports are mostly in cash, with a few pearls of indifferent quality, some

* 600,000.

† Abú-shehr and Basrah.

chests of red beads, old copper-ware, &c. All these vessels complete their return cargoes at 'Aden and Mokhá with coffee.

The coffee trade, which, next to that of grain, was formerly one of the principal branches of commerce between Jiddah and Egypt, has now much declined since the importation of American and West India coffee into the ports of the Mediterranean, Asia Minor, European Turkey, and Syria. The bad effects of the severe exactions imposed on the traffic in this article by the Páshá is illustrated by the fact, that American ships frequently leave Mokhá with coffee for the Mediterranean markets, where they are, notwithstanding the expenses incumbent on so long a voyage, enabled to supply it cheaper than the merchants who convey it thence by the way of Egypt. This trade has therefore, for some time past, been in a declining state, and in 1830 it ceased, for a period, altogether.

Corn Trade.—As the barren soil of Arabia produces but few supplies, and is utterly incapable of supporting the crowd of pilgrims that flows to Mecca during the hajj season, Egypt, from an early period, has contributed to supply its wants.

During the continuance of the war in Arabia, Mohammed 'Alí, as a means of defraying its expenses, monopolized the whole corn-trade, and disposed of all the grain that was required for the consumption of Hejáz at his own price. The revenue he derived from this was enormous, but it was collected (notwithstanding the disapprobation of the Porte, under whose especial protection the holy cities are considered as being placed) with too much facility, and its amount was found to be too considerable to be readily relinquished: he has therefore retained it. All the grain that now arrives at Jiddah and Yembo' is shipped on account of the Páshá, and no private merchant is allowed, under any circumstances, to purchase the smallest quantity until it is landed at those ports, when the surplus not required for public purposes is disposed of to merchants who afterwards retail it.

The grain is procured from Upper Egypt, and after being collected in the granaries at Kenneh, the quantity required is selected, and forwarded on camels to Kosaïr. The Páshá had several of his own boats employed in transporting it thence to the Arabian coast, but he has since found it more advantageous to freight vessels for that purpose.

Timber for ship-building is supplied either from India or by the way of the Nile from the Mediterranean. Boats are built at Jiddah and Suez, where the timber is imported. Some few are launched at Kosaïr, and others at Hodeïdah. These boats are solely constructed for commercial purposes, and piracy is quite unknown.

The number of boats belonging to Jiddah and Yembo' may be

estimated at from 250 to 300. Of these there are several descriptions: the bagalós, the dáú, the sáyer, the gánjah*, &c. The two former vary in size from 50 to 200 tons; the gánjah is a long, narrow boat, remarkable for swift sailing. The greater number of these craft are employed in the northern part of the sea, in the transport of grain from the Egyptian ports to those of Arabia, and in the conveyance of pilgrims. A considerable trade is also carried on in them to and from Jiddah, which, from its central situation, is well adapted as a commercial depôt for the productions of the upper and lower parts of the sea. Boats from Yemen, or the southern part of the sea, are not permitted to pass this port (Jiddah) without entering to pay a heavy duty, the consequence of which is, that they prefer landing their cargoes there, a part of which being required for the Egyptian market, is reshipped from thence in vessels belonging to the Jiddah merchants.

APPENDIX.

The route of the pilgrims from Caïro to Mecca.†

The noble assemblage (mahhfil sheríf) having issued from Caïro (Misr) with great pomp, proceeds to the Birket-el-hajj (pilgrims' pool), and thence to the Hidfet-el-boweïb (hamlet of the little gate), a narrow place between two hills, with an elevation and a long hill on the right. Thence to

Hamrá (the red), where there are cisterns, and lodges (fiskíyeh), built for the use of the pilgrims; thence to

Nakhíl ghánem (sheep-palm grove); thence to

Birkeh 'Ajerúd (pool of 'Ajerúd), the first watering-place; its water is sweet, and sometimes is running through the valley. There is a khán (inn) there built by Kánsú Ghaúrí, and three lodges (fiskíyeh). It is opposite to the port of Suweis (Suez), and in the same direction as the 'Ayún Músá‡ (springs of Moses). Thence to

Munserif (the divider), one day's journey. There are some pits there and vestiges, it is said, of excavations made in these places by certain kings for the purpose of joining the sea of Rúm (Mediterranean) with the sea of Suweïs (Red Sea). Thence to

Al Kubeïbát (the little domes). Here there are hills of sand like domes. This is the beginning of the desert (et-tíh) of the children of Israel; a widely-extended plain, forty farsangs in length and breadth, having Jebel Tór (Mount Sinaï) on the right, and 'Arísh on the left. Its roads are very difficult, and there is no water from the

* Properly kánjah, but vulgarly pronounced gánjah. This word is Turkish, and originally signified "a hook."

† Given by Hájí Khalffeh, commonly called Kátib Chelebí in the Jihán-numá (*i.e.* Speculum Mundi), p. 541. This route, not previously published, gives the names of places on or near the coast, and will therefore serve to illustrate Lieutenant Welstead's paper.

‡ On the road to Mount Sinaï.

cold in winter and the excessive heat in summer. Here the children of Israel were for forty years wandering about while they passed over a tract only two days' journey in extent. Thence to

Wast-et-tíh (mid-desert), or Raud-el-jemel (camel's garden); thence to

Batn-nakhl (palm-vale), or Wádí tejr (merchant's dale), where there is a spring, a castle built by Kánsú, and a lodge (fiskíyeh) which encloses the well. The guards stationed in the castle keep the water from the Arabs. 'Alí Páshá Beylerbey, of Egypt, enlarged both of them. Thence to

Wádí-el-ghaïmá (thirsty valley); thence to

Wádí-el-karíd (camel's ruminating valley). Then, after going down a declivity, to

Abyár-el-'alá (the exalted wells), a wide plain, where there are two wells; one called Bireh, the other 'Aláni. There is also a reservoir (haud) filled with rain-water, and in its neighbourhood is the Saltern, called 'Arákib* baghl (mule's muscles). Thence to

Rás-er-rekb (head of the camel-drivers). A place called Jifárát (the kids or the mounds) is in its neighbourhood.

Sat-h-el-'akabah (the plain, or the summit of the ascent), *i.e.* the 'Akabah (ascent) of Aïlah, where there was anciently a large town, now in ruins. In a low place near it there is a well lined with stone, the water of which is sweet, in a palm-grove. The Arabs settled there are of the tribe of Howeïtát.

The next station completes the first quarter of this route. Its water is sweet and plentiful. It all passes along the sea-shore. On the left† side is Mount Tór, stretching out for a space of several miles in extent. In the latter part of it there are two descents and narrow gorges (bóghház), in which there are pits with wells of sweet water. Thence there is an ascent to the

Dhahr himár (ass's back), a rocky acclivity. Thence to

Jurfeïn (the two gullies). Thence to

Sherfehi Bení 'Atíyeh (the turret or watch-tower of the children of 'Atíyeh), where there is much wood. Thence to

Matlát (the salt slough), between two mountains. Here is the permanent abode of the Bení Lám. Thence to

Maghárehi Sho'aïb (the cave of Sho'aïb, father-in-law of Moses). There is sweet water in its pits, a palm-grove, and many ethl (tamarisk) and mokl (or dúm‡) trees, like those that grow near the river Nile. There are here also inscribed tablets on which the names of kings are engraven. Thence to

Kabr-et-tawáshí (the eunuch's grave). Thence to

'Úyún kasab (reed-springs). It is a watery, rushy, and excessively hot valley (wádí). In summer time many persons die there suddenly. The grave of the children of Abraham near the sea there, is a place of pilgrimage (ziyáreh). Thence to

* Plural of 'urkúb, the tendo Achillis.
† That is, going from Mecca to Caïro.
‡ Cucifera thebaïca, or bifurcate palm; the palma thebaïca of the ancients.

Sherm (a creek), near the sea; on the left of it there is a mountain called Isháreh (the mark). Thence to

Mowílahh, on the sea-shore; there is water, but it is rancid. Thence to

Dár Kaït-Báï (Káït Báï's house), so named from that sultan having stopped there when performing the pilgrimage; before that they used to stop at Baṭn Kibrít (sulphur-belly), a narrow stony place. Thence to

Ḳabr Sheïkh el Kefáfí. Sheïkh El-kefáfí having been killed by a spear was buried there, and his grave is a place of pilgrimage. Thence to

Azlam (a very smooth arrow). The second quarter [of the whole distance] a salt, marshy place, without any herbage, and having water which is salt. In the midst of these mountains there is a desert plain (saḥrá). Mecca senna is found here. Thence to

Simáḳ (Shumach), also called Rakhánín; it is a valley (wádí) in which there are many thorns. After passing it is

Isṭabil 'Antar ('Antar's stable), an open plain among the mountains, where Arák [Avicennia tomentosa] is found, and on the borders of it there is sweet water. Thence to

Sherenbeh (the thick-pawed lion), a mountain-cape. Thence to

Wej-h (the face), a valley (wádí), in which there are wells of sweet water. They were renewed by Ibráhím Páshá in the year 930 (A.D. 1524), and are supplied by rain and torrents. Thence to

Bír-el-karawi (villager's well). Thence to

Ḥaríreh (milk porridge). Thence to

Ḥaurá (the bright-eyed girl), where there is water, but it is bitter. Thence to

'Akíḳ (the torrent's bed). Thence to

Saḥn (the bowl or dish), a circular place covered with white sand, and abounding in white vipers (afá'í). Thence to

Neb'áṇ faḳḳá' (the bubbling spring), also called ḥijár (the stones), where there is sweet water. Thence to

Taráṭír Rá'í (the shepherd's mitres). Thence to

Wádí-n-nár (fire-valley), a stony, sandy valley amid the mountains. This day's journey is known by the name of the seven rugged places (wa'r), because in it seven large rocks are crossed. Thence to

Ḥoseïrá (the little store-house or prison), a town in the territory of Yembo'. Thence to

Jebel Aḥmar (red mount). Thence to

Wádí Temá (vale of Temá). Thence to

Jebel-ez-zeïneh (mount Jewel), a place overlooking Yembo', to which the governor of that city comes, stops the bearer of sacred offerings, (maḥfili sherîf), throws a carpet (sejjádeh) over the camel, and says a prayer, accompanied by two inflections of the body (rik'ah). Thence to

Yembu' (it bubbles up), where there are several springs. Thence to

'Ụdeïbíyah (probably 'Udheïbíyah, *i.e.* possessed of good water), a town so named. Thence to

Ewwel Dehṇá (the first plain), a town so called. Thence to

Wásit (the middlemost). At this station lamps are lighted, and cannon fired off. Thence to

Bedr [Honeïn]. Thence to

Khabeb-el-bizzah (strips of cloth), an extensive plain. Thence to

Ghík, a place on the sea-shore. Thence to

'Akabah Waddán (the ascent of Waddán). Thence to

Rábigh, the place where the iḥrám is put on. In its neighbourhood is Johfah*, also called Muheï'ah.†

Here all the routes to Mecca, six days distant, unite.

The principal ancient towns between Aïlah and Jiddah are—

Ælath, Elath, or Ezion-Geber, 29° 30′ 58″ N., 35° 5′ E. (Rüppell).

Madian at Moghäït Sho'aïb, 27° 40′ 21″ N., 35° 35′ E. (id.).

Raunath near Istabil 'Antar, Leuce Come (Albus Pagus), at Haurá. Jambia; Yambo', 24° 7′ 6″, 38° 27′ (De la Badía).

Jathrippa; Yathrib, or Medínat-en-nabí (the prophet's city), 25° 13′ N., 40° 3′ E. (Jomard).

Maco-raba, Mekkah, 21° 28′ 17″ N., 40° 15′ 9″ E. (De la Badía).

Jiddah, 21° 28′ 56″ N., 39° 20′ E.

The data here given will show what approximation to accuracy was made before the survey by the officers of the Palinurus.

VII.—*Notice on the Ruins of Berenice.* By Lieutenant R. Wellsted, I. N. Communicated by the Royal Geographical Society Branch at Bombay. Read March 28th, 1836.

THE haziness of the weather and an expected southerly wind, which would have rendered our situation very precarious, obliged us to run for shelter to the N.E. extreme of Foul Bay, where we anchored within a short distance of the ruins of the ancient seaport of Berenice. And as our survey has enabled me to fix the geographical position of this spot with every necessary degree of precision, and other travellers may at some future period be desirous of visiting it. I am induced to offer the following directions for ascertaining its situation, together with some few remarks that may have escaped the notice of Messrs. Belzoni and Wilkinson, who, as far as I know, are the only Europeans who have visited these remains.

At the period of our stay in this spot, I was totally unacquainted with the nature of the discoveries made by these gentlemen: and I should have noticed ours but briefly in my journal, if it had not occurred to me, that we possessed facilities for excavating, and a command of labour, much greater than it is at all probable they

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* Hajefeh, according to M. Bianchi (Recueil de Voy. ii. 153), but this is a strange oversight.

† This itinerary is not exactly the same as that given by Burckhardt (Travels in Arabia, p. 455), and is also more complete.

RED SEA.

to illustrate

LIEUT. WELSTED'S

PAPERS

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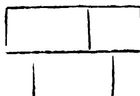
could have been provided with during their visit. On those points, therefore, where my observations agree with theirs, they may be admitted as in some degree confirming their correctness.

Since my arrival in Bombay, I have been enabled to procure Mr. Belzoni's travels, and from them I learn, that though that gentleman, from the direction of the route he had taken, supposed these ruins to be near the position assigned by D'Anville to Berenice, yet he had no instruments to ascertain that fact, and so doubtful was he as to its identity, that he traversed the sea-coast a day's journey to the southward, in order to ascertain if other ruins, corresponding still more closely with that situation, might not be discovered. The means he possessed for excavating did not admit of his making a discovery of any Greek remains. These were objects most essential to the decision of the point in question, which has so long been the subject of doubt and discussion with geographers.

From Ras Bernass, or Cape Nose, the coast, which is bold and safe to approach, extends to the westward thirteen miles, at which termination it takes an abrupt turn to the southward. The elbow thus formed assumes the shape of a small bay, which is partially protected from the southward by a low, sandy, and somewhat bushy point. From the southern extreme of this point, the ruins, forming sandy mounds, some of which are covered with bushes, may be clearly distinguished, bearing W.S.W. at a distance of two miles and a half. The landing place will be recognised by two hillocks about thirty feet in height, which rise close to the sea at the termination of a low conspicuous point of dark-coloured rocks.

From this point, which forms its southern extreme, a lagoon that appears formerly to have served the purpose of an inner harbour, though its entrance is now choked with sand, extends for some distance inland; and on its northern shore, at the distance of half a mile from the back, stand the ruins of the town. On the highest part, near the centre of these hillocks, the walls and upper portion of a small but massive Egyptian temple are left uncovered. If we except this building, which is in a very dilapidated state, and nearly buried in sand, there are now no vestiges worthy the attention of a traveller; but the chambers and buildings which we did not examine, judging from the result of our labours here, may conceal many valuable fragments of sculpture, hieroglyphics, &c., which would amply repay the trouble of excavating them.

The mounds occupy a space about a mile in circumference, of which, as I have before noticed, the temple is the centre; from this centre the houses branch off in narrow streets, mostly at right angles with each other. Two lines of hillocks, more widely separated, extending in a line from the temple towards the sea, denote

a street of larger size to have run in that direction. The houses surrounding the temple may amount in number to 1000 or 1500, but there are several detached in clusters from the city: they appear all to have been built of the soft madrepore, still used in the construction of the houses of Cossier and other towns on the shores of the Red Sea. We were enabled to trace by the walls (which were the only parts uncovered) the form and size of these habitations; they mostly consisted of three rooms, which were disposed in this form . They are smaller than the generality of houses at present existing in any part of the Red Sea coast, excepting Yembo, which is completely an Arab town. The surface of all the mounds is strewn with glass of various colours, and broken pottery. By removing the sand for a small depth, lumps of corroded brass were discovered in great quantities; some coins, the inscriptions on which were illegible, and a key, tolerably perfect in its form, were also obtained; but we were not successful in finding amidst the neighbouring ruins any articles of more importance.

The size and construction of the temple will be best exhibited by the accompanying plan and references. Its entrance faces the eastward. The limited period of our stay obliged us to confine our labours to chamber E, which appeared to have been previously partially excavated. Had we remained longer, we should probably have succeeded in clearing the whole building. After removing the sand to the depth of four or five feet, we discovered the figures I have given in the plan; and, as we proceeded, we discovered they were continued at the same level in groups round the chamber. Near the spot marked G we found two fragments, bearing Greek inscriptions, and the broken pieces of a statue, with its pedestal. Several massive stones, which had formed the roof, we next dislodged. The hieroglyphics on these were in a beautiful state of preservation. The hope of finding the remaining portions of the Greek tablets induced us to persevere in our labour until we had entirely excavated the chamber, but we were not successful. Its dimensions are given in the plan; the walls were covered with hieroglyphics, but the soft limestone with which they had been constructed has yielded to the effects of time; and the figures, with the exception of those given in the plan, are much defaced, and could be removed by merely passing the hand over them.

South-west from the ruins, and nearer the beach, there are several mounds of rubbish, covered with strong bushes: these are invariably found in the vicinity of old Egyptian towns.

It is somewhat singular, that though we minutely examined the locality, we were unable to discover any traces of either tanks or wells; nor was our search after the places of sepulture more successful.

On a first view, neither the size of the temple, nor the extent of the ruins, are such as would seem to mark the remains of a town once the emporium of the trade between India, Egypt, and Europe: yet, if we reflect that it was 270 miles from the Nile, and that it was consequently far removed from any cultivated tract whence supplies might readily be procured, there are no reasons to suppose that many inhabitants would reside there from choice, or that its size should exceed that of such a city as these ruins indicate; and I think the evidence that our observations here have enabled us to furnish, in proof of this being the Berenice Trogloditica of Ptolemy, Strabo, and Pliny, will be admitted as conclusive. I shall subjoin the following extracts from Robertson's "Historical Disquisition concerning Ancient India:"—"From the slow and dangerous navigation towards the northern extremity of the Red Sea, this canal was found to be of so little use, that in order to facilitate the communication with India, he built a city on the west coast of that sea, almost under the tropic, to which he gave the name of Berenice. This new city became the staple of trade with India. From Berenice the goods were transported to Coptos, a city three miles distant from the Nile, but which had a communication with the river by a navigable canal, of which there are still some remains, and then were carried down the stream to Alexandria. The distance between Berenice and Coptos was, according to Pliny, 258 Roman miles, and the road lay through the Desert of Thebais, almost entirely destitute of water."

"It is singular that P. Sicard ('Mem. des Missions dans le Levant,' tom. ii., p. 159), and some other respectable writers, should suppose Cossier to be the Berenice founded by Ptolemy, although Ptolemy has laid down its latitude at 23° 50′ N., and Strabo has described it as nearly under the same parallel with that of Syene (lib. iii., p. 195 D.) In consequence of this mistake, Pliny's computation of the distance between Berenice and Coptos, at 258 miles, has been deemed erroneous (Pocock, p. 87). But as Pliny not only mentions the total distance, but names the different stations in the journey, and specifies the number of miles between each, and as the Itinerary of Antoninus coincides exactly with his accounts (D'Anville, Egypt, p. 21), there is no reason to call in question the accuracy of it."

We made the latitude 23° 55′ N., differing but five miles from that given by Ptolemy.

Referring to the motives assigned by Robertson for Ptolemy Philadelphus having selected this spot in preference to others

nearer the Nile, it is natural to suppose that the monarch, desirous of gaining the object of shortening the passage in its fullest effect, would have selected a port as far to the southward as possible, (in order to avoid the strong northerly winds which prevail nine months in the year,) but which should yet be within the limits of his dominions.

To these advantages which this spot enjoys, may also be added a capacious and well-sheltered harbour, which no other locality on this coast, from lat. 23° to 24°, possesses.

The circumstance of our finding the Greek tablet must also be admitted as a strong proof (if more is required to establish the identity of these ruins with the ancient Berenice), since we are not informed that the Greeks had other towns near this spot on the coast.

VIII.—*Routes in North Africa, by Abú Bekr es siddik.* Communicated by the Rev. G. C. Renouard, B.D., For. Sec. R. G. S. Read 25th April, 1836.

THOUGH the peculiar object of our inquiries is the earth which we inhabit, yet as, in truth, that earth is only interesting to us on account of the human beings which it sustains, our views ought surely not to be confined rigidly within the physical limits of the science we profess to cultivate; and we shall not be charged with overstepping the boundaries prescribed for us, if we pause occasionally in our progress, for the purpose of contemplating man, "for whom the earth was created," under any unusual circumstances of time, place, and condition.

It is with this view of the latitude which, as geographers, we may without impropriety allow to our inquiries, that the following narrative is offered to the Society. It may not, indeed, be, strictly speaking, a geographical document, but it is illustrative of human nature under no ordinary trials and vicissitudes, and it incidentally throws some light on the geography of a remote region of the earth hitherto concealed from the eye of the European by an almost impenetrable veil. The life and adventures of a man born at Tumbuktú would be in the highest degree interesting, if written with all the details that an intelligent African could furnish; but even when there are few details—when, as in the present case, nothing more than a scanty gleaning from such a harvest can be gathered—shall it, for that reason, be thrown aside unnoticed? Shall it not rather be willingly received, as affording a gleam of light amidst the darkness which envelopes that benighted country?

Whoever has perused the lively and amusing letters on the

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West Indies, which were the fruit of Dr. Madden's residence in Jamaica, will be no stranger to the name of Edward Donellan—a negro, who attracted the notice of that active and benevolent magistrate, by the excellence of his moral character, and the superiority of his literary attainments. Dr. Madden, whose travels in the East had made him acquainted with the Arabic character, was not a little surprised to see it written with some neatness and great rapidity by a negro slave,—and his surprise was increased when he found that this slave had scarcely attained his fifteenth year when he was torn from his friends and country, and conveyed, with the prospect of perpetual slavery, to a very distant land: when, in addition to this, he found that this slave was no idolater, but a very sincere worshipper of "the one true God,"—and that, consistently with a faith comparatively so pure, his moral conduct had obtained for him the respect of his equals and masters,—his anxiety to release him from such degrading thraldom was wound up to the highest pitch. He applied without delay to Mr. Anderson, the slave's master, requesting him to fix a price, that steps might be taken forthwith for his redemption. But he applied in vain. Mr. Anderson declared that no price could recompense him for the loss of this slave's services. His integrity was such, that any sums might be confided to him; and such was his intelligence, that he kept a constant account of all the daily receipts and payments, of the rations allowed to the slaves, of articles brought into the premises, and of goods delivered from the stores. This report, as may be easily conceived, was only an additional stimulus to Dr. Madden's benevolence. He failed not to press on Mr. Anderson's attention the peculiar hardships of this poor man's case,—born in his own country in a distinguished rank, blessed with a learned education, and retaining through his own talents, industry, and integrity, a large portion of those acquirements and that respect, which he would have obtained in a very eminent degree, had he escaped the degradation of slavery. Mr. Anderson was not insensible to these powerful arguments, and with a liberality truly characteristic of the British character, replied—"That though the services of his slave were too valuable for him to fix any price upon him, he would give that liberty for which no sum of money could be named as an adequate equivalent." In consequence of this generous resolution, Dr. Madden had the satisfaction of receiving Edward Donellan's manumission by Mr. Anderson, according to all the legal forms, in a crowded court. Finding that Donellan, whose Mohammedan name is Abú Bekr, was desirous of returning to his own country, Dr. Madden determined to assist him in effecting so desirable an object; and not long after the publication of his letters, in which Donellan's narrative was first printed, he recommended him to

Mr. Davidson, an enterprising traveller, who had resolved to make another attempt to reach Tumbuktú. Abú Bekr, in the meantime, had come over to this country under the care of Captain Oldrey, R.N., another of the auxiliary magistrates in Jamaica, who had cordially united in promoting the welfare of Donellan, both before and after Dr. Madden's departure from the West Indies. In Morocco, Mr. Davidson was prevented by various circumstances from passing, as he intended, through Fez and Táfilelt, in his way to the Ṣaḥrá or Great Desert; but having been required to attend on the King at the capital, his medical skill and attention to his numerous patients secured for him that favour and permission to proceed, which at first seemed utterly unattainable; and after passing about two months there, he was suffered to proceed to Mogadore in his way to Wád Nún, whence caravans set out on their journey to Negroland. While at Morocco, they met some persons who were acquainted with members of Abú Bekr's family, and informed them that one of his relations is at present governor of Tumbuktú.

The narrative of his life, from which the following abstract is taken, was written after his arrival in this country, in the presence of a friend with whom he was spending a few days in the neighbourhood of London. It is no doubt the same in substance as that compiled from his oral communication by Dr. Madden while in Jamaica, and printed in his work. It agrees, almost word for word, with another account of his life, drawn up while he was on his voyage from New York, at the request of Captain Oldrey. All these papers were written in the Arabic language—the only one which Abú Bekr had ever learned; for his accounts and memorandums, which were so useful to his employers, would have been of no service without his interpretation,—as, though expressed in the English tongue, they were written in the Arabic character, and the difficulty of decyphering negro-English, so expressed, may be easily imagined.

But it is time to allow Abú Bekr to speak for himself. His narrative is thus headed:—"This is an account of the beginning of my life.

"My name is Abú Bekr eṣ ṣiddíḳ: my birth-place is Tumbut. I was educated in the town of Jenneh (Genneh), and fully instructed in reading and construing the Korán,—but in the interpretation of it by the help of commentaries. This was [done] in the city of Ghónah, where there are many learned men ['ulemà], who are not natives of one place, but each of them, having quitted his own country, has come and settled there. The names of these sayyids who dwelt in the city of Ghónah were as follows:—'Abd-Allah ibn-al Ḥájj; Moḥammed Wataráwí; Moḥammed al Muṣṭafá; Fatíḳ, the white [man] [al abyaḍ]; Sheikh 'Abd-

äl-ḳádir Sankarí, from the land of Fútah Jálló; Ibráhím ibn Yúsuf, from the land of Fútah Tóró; Ibráhím ibn Abí-l Ḥasán, from Sillá by descent, but born at Járrah. These men used to meet together to hear the instructions of 'Abd-Allah ibn-al Ḥájji Moḥammed Tafsír.

"My father's name was Karah Músá, the Sheríf*, Weteráwí, Tafsír, *i. e.* of the royal family †. His brothers were named Idrís [Enoch], 'Abdu-r-raḥmán, Maḥmúd, and Abú Bekr. Their father's name was Már ‡, al Ḳáïd, 'Omar ibn Sháhidu-l-muluk [son of the King's witness or chief law officer] in the cities of Tumbut and Jenneh. He § was also called Ibn Abú Ibráhím, because Ibráhím (may his grave be visited!) was of this country. He was their father's first-born, and for that reason my name called by the name of his brother Bekr.

"After their father's death, there was a dissension between them and their families, and they separated, and went into different countries of the blacks ‖. *Idrís* went to *Járrah*, and married a daughter of Már, al-káïd Abú Bekr: her name was Ummuyu,—and he dwelt there. *'Abdu-r-rahmán* travelled as far as the land of *Kong*. He married the daughter of Abú Thaúmá 'Alí, lord of that country and dwelt there. The name of his wife was Sárah. *Mahmúd* [travelled] to the city of *Ghónah*, and settled there. His wife's name was Zuhrá. *Abú Bekr* remained at *Tumbut* with the rest of the family ¶. He was not married at the time I left our country.

"Before all these things happened my father used to travel about [continually]. He went into the land of Kashinah and Bernú. There he married my mother and then returned to Tumbut, to which place my mother followed him. It came to pass after this, that he remembered his brethren, repented on account of them and wept bitterly. He then ordered his slaves to make ready for their departure with him [on a journey] to visit his brethren, [and see] whether they were in [good] health or not. They, therefore, obeyed their master's orders, and did so; and went to the town of Jenneh, and from thence to Kong, and afterwards to Ghónah. There they abode and continued to serve their master, collecting much gold for him there. In that country much gold is found in the plains, banks of rivers, rocks, and stones. They break the stones, and grind them, and reduce them

* That is—"Descended from Mohammed."

† "Kabílah," which properly signifies "tribe," but appears to be used by Abú Bekr in the sense of "family."

‡ The same as Emír.

§ That is Abú Bekr's father, as appears from the sequel.

‖ Al-súdán for Bilád-as-súdán—the countries of the blacks.

¶ Literally "with the other tribes." It probably means "with the other families of the same tribe."

to dust. This is then put into vessels, and washed with water till the gold is all collected under the water in the vessels, and the dust lies above it. They then pour out this mud upon the ground, and the gold remains in the vessels; and they spread it out to dry. After that, they try it [on a touchstone], and make such things of it as they are able. For money or exchange they use shells, called al woda'*, gold and silver; they also barter goods for goods, according to the measure of their value.

"My father collected much gold in that country, and sent much to his father-in-law; together with horses, asses, mules, and very valuable silk garments brought from Misr, with much wealth, as a present to him. He was my mother's father; his name was Al Hájj Muhammed Tafsír, of the countries of Bernú and Kashínah, both inhabited by his family.

"After this my father fell ill of a fever, and died in the city of Ghónah. He was buried there, and his brothers went and made a great lamentation for him. At that time I was a child; I knew nothing of this, but all these things were told me by some of our old men. They [my father's brothers] returned afterwards to their own dwellings, and Mahmúd [alone] was left in the city of Ghónah.

"My mother's name was Nághódí, that is, in the Haúsá tongue; but her real name was Hafsah†. Her brothers were named 'Abd-allah Tafsír, As-sifá, Ya'kúb, Yahyá, Sa'ad, Hámid Bábá, Múmin, 'Othmán, and 'Abdu-lkerím. Her sisters were Habíbah, Fátimah, Maryam, and Maïmúnah. Their father was named Al Hájji Mohammed Tafsír, of the cities of Kashínah and Bernú. With respect to my mother, she was born in the city of Bernú. Her father, when he went to perform the pilgrimage [to Mecca], left her mother suckling her, on which account her name was called Nághódí.

"My brothers were named 'Omar, Sálih, Sa'íd, Músá Bábá, Múmin, 'Abd-allah, Suleïmán, Mustafá, Yúsuf, and 'Abdu-r-rahmán; but by my mother's side, Sálih only. My sisters were 'A'yishah, Aminah, Selímah, Hawái [Eve], and Keltúm; but Aminah only on my mother's side. These men and these women issued, all of them, from the stock of the Sheïkh 'Abdu-l-kádir, the sheríf, and their family name is Mór.

"About five years after my father's death, I asked my instructor, who taught me the Korán, to go with me to the city of Ghónah to visit my father's grave. He answered, 'Yea, Abú Bekr as-siddík, if it please God, I will do that thou dost desire.' He then prepared himself, and sought for provision for the road; and he

* That is, karuís, or blackmoor's teeth, the Cypræa Moneta of Linnæus.

† He means her name as a Mohammedan; by her countrymen of Haúsá she was called Nághódí, a significant word in their language.

was followed by a large company of his disciples*, who bewailed him. We reached the city of Kong, and afterwards went on to the city of Ghónah; and abode there a long time, reckoning that country as our own. We found protection † in that country. Two years after our arrival in Ghónah, it entered into my teacher's heart to set out on the pilgrimage; and while he was making diligent inquiries from people who were going to perform the pilgrimage, some men told him of the business of Moḥammed Keshín and his brother 'Omar, and Adam, of the land of Buntukkú. He then began to make inquiries of the people of Buntukkú, and they told him that Omar and Moḥammed Keshín had departed, and had left Adam behind; that he was not [now] going, but wished to go. My master made haste to seek for him in some of the towns, and left me in the city of Ghónah with my uncle Maḥmúd.

"At this time we heard the news of the business of Adingharah, Sulṭán of Buntukkú, after the Sulṭán of Bandah, or Inkoransá, who was named Afwá, had been killed. They say Adinḳarah wished to kill Kujóh, governor of Kolongzhwí, a town belonging to the Sulṭán of Ghónah. He wished to kill him, because of what had happened between him and Dikkí, his deputy [who had been killed by Kujóh]. Adinḳarah therefore wished to put the latter to death by way of retaliation. Adinḳarah, Sulṭán of Buntukkú, sent to Kujóh, requiring him to pay a great deal of gold as a ransom for his life ‡, and Kujoh sent what he required; but he refused to accept it, and said to Kujóh's messenger, 'Return to thy master, and say to him, "Unless thou increase it by 200 times as much, I will not accept it; but my sword shall take his head from off his neck; thou shalt die a swift death." When this messenger came to his master, and told him these words, Kujóh stretched out his hand, took back the gold, and kept it; and likewise sent a messenger to the Sulṭán of Ghónah to tell him what had happened.

"Then was Adinḳarah very wroth; and he ordered all his captains to gather all their soldiers together, and follow him to make war against Kujóh, and to kill him, that they might avenge the death of his servant Dikkí. When the Sulṭán of Ghónah heard that Adinḳarah, Sultán of Buntukkú, and his army, had come against them to kill them, he and all his host, together with Kujóh, rose up to meet them, and marched against them as far as the town of Bolóh, choosing to attack them there; and there they

* Ghilmán means "young men," but it also means "slaves;" however, Abú Bekr seems to have used it in the sense here given.

† Sultánán may mean 'a sultán;' but the power of living securely is probably what is here meant.

‡ The price of blood, or fine for having taken away a man's life.

fought from mid-day till evening. Then they separated, and returned to their own places. Seven days afterwârds, they again gathered themselves together, and engaged in battle, at the town of Amvighóh. It was a hard-fought battle, and many souls perished on that day. Thus did Adinkarah overcome the King of Ghónah, and take the town of Amvighóh. The people of Ghónah fled, and some of them passed on [as far as] to the city of Kong.

"On that day was I made a slave. They tore off my clothes, bound me with ropes, laid on me a heavy burden, and carried me to the town of Buntukkú, and from thence to the town of Kumásí, the King of Ashantí's town. From thence through Askumá and Ajimmakúh, in the land of Fantí, to Daghóh, near the salt sea.

"There they sold me to the Christians, and I was bought by a certain captain of a ship at that town. He sent me to a boat, and delivered me to the people of the ship. We continued on board ship, at sea, for three months, and then came on shore in the land of Jamaica. This was the beginning of my slavery until this day. I tasted the bitterness of slavery from them *, and its oppressiveness: but praise be to God, under whose power are all things, He doth whatsoever he willeth! No one can turn aside that which He hath ordained, nor can any one withhold that which He hath given! As God Almighty himself hath said:—Nothing can befall us unless it be written for us (in his book)! He is our master: in God, therefore, let all the faithful put their trust!

"The faith of our families is the faith of Islám. They circumcise the foreskin; say the five prayers †; fast every year in the month of Ramadán; give alms as ordained in the law; marry [only] four free women—a fourth is forbidden to them except she be their slave; they fight for the faith of God; perform the pilgrimage [to Mecca]—*i. e.* such as are able so to do; eat the flesh of no beast but what they have slain for themselves; drink no wine—for whatever intoxicates is forbidden unto them; they do not keep company with those whose faith is contrary to theirs,—such as worshippers of idols, men who swear falsely by the name of the Lord, who dishonour their parents, commit murder or robbery, bear false witness, are covetous, proud, insolent, hypocrites, unclean in their discourse, or do any other thing that is forbidden: they teach their children to read, and [instruct them in] the different parts of knowledge; their minds are perfect and blameless according to the measure of their faith.

"Verily I have erred and done wickedly, but I entreat God to

* That is—the people of Buntukkú, Ashantí, and Fantí. This is more distinctly expressed in another paper written by him.

† That is—pray five times a-day.

guide my heart in the right path, for He knoweth what is in my heart, and whatever [can be pleaded] in my behalf.

"Finished in the month of August, on the 29th day, in the year of the Messiah 1834 [1835]."

From this narrative we collect that the writer of it was born at Tumbuktú, about the year 1794; that his grandfather 'Omar was an al-ḳáïd, or magistrate, in that city and in Jenneh on the Jálibá or Niger, and son of the king's witness, one of the principal law-officers of the state. Kong, where his uncle Abdu-r-raḥmán settled, is the place in the chain of mountains running parallel with the southern coast of Africa, the position of which was pointed out to Mungo Park. Its distance and bearing with respect to Jenneh, as far as Abú Bekr could give any notion of them, appear to agree nearly with the position assigned to it in Mr. J. Arrowsmith's Map of Africa. Ghónah, the residence of Maḥmúd, another of Abú Bekr's uncles, is about eight days journey east or south-east of Kong. That place he believed to be mid-way between Jenneh and Ashantí. But as the distance between Ghónah and Ashantí is twelve days' journey, that capital, the position of which is known, must be about twenty days' journey distant from Kong, and forty from Jenneh. Abú Bekr was two months on his way from Jenneh to Kong, but he thought the journey might be completed in fifteen days; twenty days, therefore, gives a fair mean, and confirms his supposition that Kong is just mid-way between the Jálibá and Ashantí.

When only two years old, his father removed to Jenneh from Tumbuktú, or, as Abú Bekr generally called it, Tumbuttú, or Tumbut*; of that place, therefore, he had no recollection. When only four years old he lost his father; and five years afterwards, when he was in his tenth year, he went to Ghonah to visit his father's burial-place, stopping one year at Kong on the way. On the supposition, therefore, that he remained three years at Ghonah, he was in his fourteenth year when he fell into the hands of the Ashantís, and was sent as a slave to the West Indies either in 1807 or 1808. Amvíkoh, the place where he was seized by the people of Buntukkú, is fifteen or twenty miles to the south of Ghonah, and nine days' journey south of Kumásí, the capital of Ashantí. Daghó, the place on the coast where he was put on board ship, is mentioned by Protten, the Danish missionary, as not far from Winnebá, one of the British forts. (Adelung, Mithrid., iii., 188.) From Daghó, or rather Cape Coast, Abú Bekr was carried to Jamaica, in which island he passed about twenty-seven years of his life, first as the slave of a stone-mason named Donellan, subsequently on the estate of Mr. Haynes, and

* Nearly resembling the Tombutto of Leo Africanus, (p. 642,) and clearly an abbreviation of the Tungubutú of De Barros, (Asia, i., 220.)

finally as the property of Mr. Anderson. Donellan was a very kind master, and when he told his slaves, about a year after Abú Bekr was purchased by him, that, as his mother wished to see him, he must return to England, after selling his property in Jamaica, they all shed tears. Mr. Haynes, it appears, was not himself resident on the island; and it was by his order that Abú Bekr, and the rest of the slaves on his estate, were baptized. In what manner they were prepared for baptism, it was difficult to ascertain: certain it is, as we learn from Dr. Madden, that the Mohammedans still retained their faith in the divine mission of Mahomet. It was at his baptism that Abú Bekr was named Edward Donellan. Mr. Haynes's benevolent intentions cannot be doubted; but, as is too often the case where the planters are not residing on their property, his overseers and agents did not faithfully execute his orders, for "it was then," says Abú Bekr, in a paper written on his voyage home, "that I tasted all the bitterness of slavery." On the 6th of September, 1823, Mr. Haynes's property was sold, and Abú Bekr was purchased by Mr. Anderson, who, having discovered his steadiness and honesty, employed him to take an account of all that came or was issued from his slave yard. He put down everything in negro English and in the Arabic character, (for he never had an opportunity of learning to read or write English,) and read it off to the overseer in the evening. His cyphers they perhaps could read themselves, and therefore prove his sums; but as he is well acquainted with the first rules of arithmetic, and very careful, they were probably satisfied with the sum total that he gave in. After his liberation he continued in the same employment, but his condition could hardly be said to be improved, as his employer merely gave him his board, and appears to have withdrawn most of the former indulgences, without substituting wages in their stead. Nor, but for the kind and determined assistance of Capt. Oldrey would he have been suffered to come to this country, or indeed to leave Jamaica.

Of the kindness of his present master he speaks in terms of the warmest gratitude; and Mr. Davidson, on his part, fully appreciates his merits. Should that enterprising traveller be so fortunate as to reach Tumbuktú in safety, he will find—independently of the rank which, it seems, Abú Bekr's relations there hold—that so faithful, affectionate, and intelligent an interpreter is a treasure, the value of which cannot be too highly estimated.

As the veracity of Abú Bekr's narrative has received an unexpected corroboration from the testimony of persons whom Mr. Davidson saw in Morocco, it may appear superfluous to enlarge upon the circumstances which justify our reliance on the truth of his statements; but a brief mention of a few will perhaps be considered as an appropriate conclusion to this paper.

We may say, then, that his general good character, his years as indicated by his face, and the cessation of the slave-trade in March, 1808, are all so many evidences in favour of his statements respecting the age at which he was carried to the West Indies. His knowledge of the Arabic language is another very cogent proof of the truth of his statements. Though far from being able to write it with strict grammatical accuracy, or possessing the command of an abundant stock of words and phrases, his power of expressing himself in that copious and difficult tongue, and the clearness and facility with which he writes its characters, are truly surprising when his peculiar circumstances are taken into account. He could scarcely have completed his fifteenth year when taken away from Africa; was two years in the West Indies before he could obtain the use of pen, ink, and paper; and, with the exception of two or three negroes,—one fortunately on board the slaver which carried him off,—had no means of reviving his remembrance of what he had learned, till a very late period.

Some time before he left Jamaica, a benevolent stranger, who found that he could read Arabic, sent him, from England, a copy of the New Testament in that language; and he had also read parts of the Old Testament with attention, as is evident from some texts quoted in the narrative written on his voyage from New York to England. On seeing the plates in Mr. Bowdich's Travels, he immediately recognised a street in Kumásí, and the magical ceremonies of the Ashantí soothsayers; in Mr. Dupuis's book also the passage of the Basomprá. He mentioned many of the names of kings and chiefs, of whom those writers speak. At the British Museum, he instantly recognised many old acquaintances; particularly the hippopotamus, who, he said, always came out of the water at certain hours, and did a great deal of mischief. With the plants and seeds he seemed equally well acquainted; particularly the nittah, a species of acacia, and the palms,—most of which he could never have seen in the West Indies. His acquaintance with the Korán was no less remarkable. "What became of that wicked king, Frόna?" said he, to one of his friends from whom he had already received some information.—"I never heard of Frόna," said his friend.—"Oh, yes," replied Abú Bekr, "you know him,—he is spoken of in the Bible; he was King of Miṣr,—he is mentioned in many places in the Korán."—"Write down his name, then," returned his friend; and he immediately wrote "Fir'aun," *i. e.* Pharaoh, very correctly spelt. It was too late to look for the Korán that night; but the next morning, he in a few minutes found out almost all the places where Pharaoh is mentioned—scattered, as need hardly be said, all over the book. In the summer, he chaunted the call to prayer —given by the Muedhdhins from the minarets of the mosque—

with the exact pronunciation, intonation, and rhythm, that is used from Caïro to Constantinople, and from Belgrade to Dehlí.

The Korán he must have known almost by heart, as he declared he had never seen a copy of it from the time he left Ghónah till one was put into his hand by the writer of this paper. He was not old enough, he said, when captured, to enter on a course of logic and rhetoric, or to study the commentaries on the Korán; but he knew the names of the most celebrated commentators. This is a plain proof of the superior civilization of the negroes in the interior over those near the coast; and, however incredible at first sight, it is confirmed by Burckhardt's account of the Shaïkíyah Arabs in Meroë, and the well-written Arabic despatches from Bello's court, now in the records of the Foreign Office.

In the short interval of three, or, at most, four days, very little could be gleaned from Abú Bekr's recollections of his native land; but the itineraries annexed to this paper may assist in fixing more nearly the relative position of some places already known by name, in pointing out others not before heard of, and in removing some of the obscurity in which the geography of that part of Africa is enveloped.

Routes given by Abú Bekr.

1.—*From Jenneh to Kong.*

The country of the Sarankolí[1]	Moslims and Káfirs	Level country.
Simfuya, also called Bá Kwé	Moslims	
Keweï[2], a city belonging to Korongó	Moslims and Káfirs	
Múṣé, Móṣí, or Móngṣí (a tribe)	Káfirs are masters	
Markafí or Markafing (a tribe)	Káfirs and Moslims in equal numbers	
Bó' lók ditto	Ditto ditto ditto	
Kong[3], the capital of a kingdom so named		Mountains.

2.—*From Kong to Ghónah, eight days.*

Kongolú[4]	Inhabitants call themselves Mandingà, are generally Moslims, and are subject to Kong.
Karwalá	
Kóyen, Koyení or Kong-yenéh	
Sámbatah, near a river	
Balaboló[5]	
Donsá-dughú[6]: the first place in the kingdom of Ghónah.	
Kungzhíyah	All are of one tribe, and Moslims, but subject to Káfirs.
Seyyidí or Yalú	
Purrà	
Ghónah[7]	

3.—*From Ghónah to Dabohyah, about eight days.*

Ghónah or Ung-koláh.

Cross the river Vunkurú, Igelá or Wáh.

Boló, a country or province.... Yakó, Yagó or Yabó.......... Dabóyah[8]	Inhabitants half Moslims and half Káfirs: by themselves called Um-Bangyá; by others Intà or In-Tá[9].

4.—*From Dabohyah to Hausá.*

Dabohyah

Ghambaghah[10] .... Inhabitants called Dabamba, Dagomba or Dagwambah.

Sállaghah[11] or Sallakhah.......Inhabitants Intà.

Cross a river.

Bóghyorí[12], Bóghayirí, Poghoyirí or Boghodí.

Sangsang-í Mango[13].

Gurumá or Grumá[14].

5.—*Ghónah to Kumási, eleven or twelve days.*

	Days' Journey.	
Ghúnah		in Ghónah.
Amvikó, a city..............	½	in Ghónah.
Bontokú or Buntukkú	4	in Buntukkú.
Kíkiwerrí..................	1	in Buntukkú.
Nyámí[15]	1	in Ashantí.
Ansirí, near a lake...........	2	
Komásí, capital of Ashantí....	1	
	9½	

6.—*From Kumásí to the sea, about two days and a half.*

Komásí.

Lake of Basomprá.

Wássah, a tribe .... 1½ day.

Asokomá.

Ajimmakú.

Daghó, a little below Inkará (Accra) ...1 night.

The places in Negroland known to Abú Bekr, either by his having been there or by report, are as follows :—

1. Sillá, very near Segú, to the west of Gennah or Jenní, on the Jálibá, which is called Kwárá by the people of Hausá.

2. Filah-dughú or Fullah-dughú, *i. e.* the land of the Fullahs, Fullans or Fulláníyu, called by themselves Pullo or Pullu, and Fellátah by the Arabs.

Galiyà .. .... Nomà........ Duwasò ...... Tumané ...... Morilà	are places in Fulah-dughú.

3. Banan.

4. Másináh ; beyond which is the lake or river of Jimbalá, supposed to divide Ayí and Wáwí from Ashantí.

The whole tract between Másináh and Tumbuktu was governed (from

1804 to 1808) by the Fullání chiefs Al Imám 'Othmán, Ḥámid ibn 'Alí Damár, and 'Alí Jeïdú.

5. On the Jálibá he had heard of Sillá, Yamínaḥ, Modibú, where the people were very learned, and Bammakú.

6. Buré is a principal place in the Mandingo country.

The Mandingás say they came from Mandi, a city in or near Malé[16], beside Hausá, whence the people of Hausá are called Malbah or Malwah[17].

7. The river Sáranó, running through Wáselú[18].

8. He had heard of the following places between Ségú and Sierra Leone, and had in many instances a correct notion of their relative position :—

Firià,
Sangarà or Sangalà,
Kurankó,
Limbá[19],
Fútah Toro, N.E. of the Bá-Dima,
Fútah Jállú, S.E. of ditto,
Dentíliyà,
Koniyà,
Kongo-dughú[20],
Sata-dughú[21],
Brukó or Birikó[22],
Fullah-dughú,
Gadu,
Bundu,
Wulli,
Sín,
Susú,
Tandah,
Ferbanà[22],
Kajághah, near Khásó,
Jághah (pronounced Járrah),
Kemmú,
Bámbarah,
Bambughú[23].

NOTES.

[1] The Sarakhwulé of Dard (Gramm. Woolfe, p. 149), Serrawoolli of Park, Seracolet of the older French writers, and Çarogole of the Portuguese, De Barros, &c.

[2] Kaybee of Bowdich.

[3] The capital named Kong is at the foot of the mountains, and in a lofty one near it there is a gold mine. As far as Boló the soil consists of clay and sand, with low hills and small streams. At Kong the mountains begin. Kong is supposed to be mid-way between Jenneh and Ashantí. From the latter it is nineteen or twenty days distant, and therefore about as much from the Jálibá. Abú Bekr was two months on the road thither, but supposed the journey might be performed in fifteen days; which is no doubt too little.

[4] The King's name was Makkah, and his Vezír was called Al Aḥmar, i. e. the Red Man.

[5] A large river crossed in canoes near Balaḥolóh, comes from Gago; passes by Purrá, Sámbatah, Barabolú, Kurumgazá, Mangó, Wáwí, to the east of Koromantí, i. e. Ashantí, to Kang-gà, where it falls into the sea. It is the largest river between Kong and Ghúnah. Abú Bekr supposed it to be a branch of the Jálibá, issuing from the main stream, not very far from Jenneh.

[6] A small town.

[7] Much gold is dug up near Ghónah. As far as Sámbatah the ground is level and clear, with occasional patches of wood. Near that place, after crossing a hill, the road leads down to the river, which divides Balabulú from Donsá-dughú.

[8] The place where salt is made.

[9] The people of In-tà are of the same race as those of Ghónah.

[10] Pronounced Gambarrah.

[11] Near this place is Yandí, belonging to In-tà.

[12] That is, Woman's town, in the Mórí and Dabambah tongue.

[13] That is, the Great Warrior's camp. That is the same word as the "Sansanding" of Mungo Park.

[14] Gurumá is bounded on the east by Hausá; on the north by Mósí; and on the south by Nangó or Nagó Kiyyakwásí; the Anago of the maps. Kiyakwásí, pronounced Chakwásí, signifies "Father Kwásí" in the A'yí tongue.

[15] The Yamma of Mr. Bowdich; it is on the frontiers of Ashantí.

[16] The Málí of Ibn Batútah, and Melli of Leo Africanus. Perhaps the Mellil of Idrísí.

[17] Hence we learn that Hausá is synonymous with Málí, pronounced Mélí. Málawá (the Mallowa of Mr. Bowdich) or Málabá is the adjective derived from Málí, just as Kachenáwá and Bernáwá are derived from Kachená and Berná. Málawá was transformed into Malay, by Snelgrave and Des Marchais.

[18] The Ouasselon of Mollien.

[19] Liban in Mollien's map; "but it should be Limbá," said Abú Bekr; and so it is in the map of Colonel Laing, who passed through that country.

[20] Konkodou of Mollien.

[21] Satadou of the maps.

[22] That is, "Ruined-town" in the Fullan language.

[23] Bambook of the maps.

IX.—*Observations on the Ancient Intercourse with India, suggested by some Remarks contained in a Paper communicated by Lieutenant A. Burnes to the Geographical Society of Bombay, on "the Maritime Communication of India, as carried on by the Natives."* * By Lieutenant Dickinson, 14th regiment B. N. I. Communicated by the Branch Society at Bombay. Read 9th May, 1830.

It appears, from a passage in the paper above-mentioned, that Lieutenant Burnes is of opinion, and wishes to establish, that the commerce "was never interrupted by religious prejudices," and "that the natives of India themselves, *and not the Arabs*, conducted the trade between India and Egypt."

As this question has long excited a considerable degree of interest among the learned of Europe, where the generally received opinions appear to be opposed to that of Lieutenant Burnes, I am in hopes that the following observations on the subject, though they contain but little that is new or original, may not be considered as uncalled for or unacceptable. It is very well known that a maritime intercourse between India and the countries bordering on the Mediterranean subsisted in times long antecedent to the Christian era; but this, unfortunately, is all that is known with certainty on the subject, for Strabo, who wrote in the early part of the first century, declares that he knew very little about India, notwithstanding the great advantages which his residence in Egypt, and his general information were calculated to give him. Still in ancient history many things are recorded relative to an early intercourse with India, a brief summary of which will not, I trust, be thought uninteresting; inasmuch as it

* See p. 23.

will show, that, so far as our scanty information can guide us, we are led to conclude that the Arabs, rather than the Indians, are entitled to the credit of having been the first navigators of the Indian seas.*

It has been supposed by those who are perhaps better qualified than any other authors of modern times to form an opinion on the subject in question, that the intercourse with India is of the highest antiquity, and that the line of communication was originally by land. For we find it recorded in the ancient histories of Agatharchides and Strabo, that in the earliest ages the Arabians had attained a very high degree of commercial prosperity, which was chiefly centred in three great tribes: first, the Sabæans or Arabs of San'á, the richness of whose country sufficiently accounts for the wealth they enjoyed; secondly, the Minæans, whose country lay contiguous to San'á, who, we are told, were the great carriers of the trade between Sabæa and the countries bordering on the Mediterranean, whose wealth we thus trace to their mercantile enterprise; thirdly, the Gerrhæans, who occupied the coast about Al khatíf and Bahrein, of whom we are told that they were "the carriers by land of the produce of Arabia," and of "*packages of aromatics,* which they carried to Idumea." Now the aromatics of Yemen we must suppose to have been monopolized by the neighbouring Menœans, between whose country and Gerrha stretches that immense desert which, we are told by the Nubian geographer, cuts off all communication across that part of Arabia. It therefore becomes a question, whence was the trade, and whence the wealth of the people of Gerrha? which can only be answered by supposing them to have been derived from an intercourse with India. The route, then, by Gerrha we may reasonably suppose to have been the oldest line of communication with the East.

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* It is worthy of remark, that in a nation of which the striking peculiarity is its artificial division into castes, each of which is restricted to its own particular duty and occupation, there is *no caste of sailors.* For the several tribes of Coolees, Gabeets, Gowrees, &c., who are engaged in the native vessels on the west coast of India, are, properly speaking, only fishermen and boatmen, whose business is, or should be, solely alongshore; and this I think we may venture to regard as one strong argument against the claim of the Hindoos to being the carriers of the ancient trade of India. The motley crew of the boat whose voyage Lieutenant Burnes has related (consisting of six Moslems, three Rajpoots, and a negro) is rather an argument that the hardness of the times, and want of occupation have driven the Rajpoots to a seafaring life, than that navigation was ever regarded as the business and legitimate occupation of any of the thousand castes of the Hindoos. Marco Polo observes of the people of Maabar, so late as the thirteenth century, that among them "a prejudice exists against persons frequenting the sea, who, they observe, can only be people of desperate fortunes." (Mar. Polo. lib. iii. c. 20.) With regard to Hindoo agents, we read that even at Bokhara, "the stronghold of Islam," the ruler of which has usurped the proud title of "Commander of the faithful," no less than 400 of the idolaters of Hindoostan have ventured to establish themselves. "Auri sacra fames, quid non mortalia cogis Pectora?"

"For (to use the words of Dr. Vincent* on this subject) if it be agreeable to analogy and to history, that merchants travelled before they sailed, there is no course from India to the Mediterranean where so small a space of sea must be traversed as in this direction." To the above-mentioned tribes we may suppose belonged "the company of the Ishmaelites, who came from Gilead with their camels, bearing spices and balm and myrrh, going to carry it down to Egypt," into whose hands Joseph was sold by his brethren, as recorded in Genesis xxxvii. 25.

If the above supposition be admitted, the communication by this route may be referred to the eighteenth century before the Christian æra, and from this period I am not aware of there being any reference in the pages of history to anything connected with an intercourse with the East till the time of David, in the eleventh century B.C., when Hadad, prince of Idumea, was driven from his kingdom, and when the consequent occupation of Elath and Ezion Geber, at the head of the sea of Akaba, afforded to the Israelites the means of establishing, in a more direct manner than had hitherto been practicable, a communication between the shores of the Mediterranean and India.† But as the people of Israel were

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* So also says Dr. Robertson:—"The intercourse, however, between different countries was carried on at first entirely by land."

† It has been supposed as not improbable, that the ships of Solomon were the first which ever sailed along the coasts of Arabia, and that the Arabs from them learnt the art of ship-building and navigation; and it is asked with reason, in support of this supposition, If the Arabs had vessels, and were able to navigate them, why should Solomon (who, we are told, "received gold from all the kings of Arabia") have gone to the unnecessary trouble and expense of bringing men and materials to equip his fleet from Tyre and the distant ports of the Mediterranean, instead of availing himself of the assistance of his allies, the kings of Arabia? To this, however, it may be answered, that in all probability the coasts of Arabia were then, as they are now, in the possession of several tribes of Arabs, each under its own sheïkh, a chief independent of, and different, in interests and pursuits, from the Arabs of the plains, who alone appear to have attained that stage of civilization and nationality (if I may so express myself) as would entitle their chiefs to the dignified title of "kings of Arabia." It therefore by no means follows, that an alliance with the Arab princes of the interior would secure to Solomon the co-operation and assistance of the maritime sheïkhs who occupied the harbours and the islands of the Red Sea. I am of opinion that the Arabs had vessels before the time of Solomon. The sight of what, at first, would have seemed a new world lying on the opposite side of a narrow sea, must have offered to a bold and adventurous people a peculiar inducement to cross the water. The coasts of Arabia were covered, in early times, with woods and forests of lofty trees; and the prospect of a country rich in natural productions would induce the wanderers to repeat their visits, and to establish an intercourse, the first perhaps in antiquity, where the sea was the only channel of communication. Besides, Job, whom I agree with M. Goguet in placing in an age antecedent to Moses, and in the country of Idumea, makes mention of ships as of things well known, which I am of opinion he could only have seen or heard of in the sea near which I suppose him to have lived. Moreover, the general voice of antiquity has assigned to Erythras the honour of being the inventor of navigation. Whether there is any truth in the stories told of Erythras, that he resided on the western coasts of Arabia, and that he was drowned in the Red Sea, which was therefore called the Erythræan, is of no great importance to my present argument, so long as it appears that the general

not themselves a maritime nation, this intercourse was carried on by the aid of Hiram and the Phœnicians of Tyre, at that time the most celebrated navigators in the world; I will not pause to inquire who was the Queen of Sheba, or where was the port of Ophir, so famous in sacred history. I would merely observe, that here again we find the produce of India brought into Palestine, not however as before, by the caravans of the Ishmaelites, but by the channel of the Red Sea. In the reign of Jehoram, in the ninth century B.C., the Idumeans revolted, and the ports, or the sea of Akaba, were for ever lost to the children of Israel: the trade, however, was continued after the destruction of Jerusalem by the armies of Nebuchadnezzar, as we learn from the imports, into Tyre, of "cassia and calamus," as recorded by Ezekiel xxvii. There is no doubt that this communication was carried on by water, but whether directly or indirectly, whether the Arabs or the Indians had any concern in it, is a point which, unfortunately, we cannot ascertain.

From this period I can find nothing further on the subject, till the time of Alexander, in the fourth century B.C., and even then but little can be learnt with certainty. From the voyage of Nearchus, we learn that there were ports and several vessels in the Gulf of Persia; and as we know that the Persians have always been notorious for their aversion to the sea,* we are led to suppose that

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opinion of antiquity supposed that the art of ship-building and navigation was first practised on the coast of Arabia.

It would be interesting to ascertain when lateen sails were first used on the Mediterranean; for it is evident that the vessels in common use on that sea are essentially the same as those of Arabia and of the East. They could hardly have been known in the time of Pliny, for the sea phrases of that period distinctly refer to a square-rigged vessel, such as we see represented on old coins and marbles; and the principle on which the ancient vessels were built, which is said to have been taken from the form of a duck, is directly opposed to that which is followed in the Arab boats, in which the most buoyant part is towards the stern.

The name Xebec, or Xebeque, commonly applied to these lateen-rigged vessels in the Mediterranean is, I think, Arabic, probably from سبيق Sebík, "fast-sailing or going," from سبق Sabak, "he overtook." For as the S and the X of the Arabs Greeks were commutable letters, Xebeque would be the exact representative of the Arabic Sebeque. If the name is thus derived, we may reasonably infer that vessels also were borrowed from the same original.—A.

[Xebec is a corruption of the Spanish word *xabeque*, which, with *xábeca*, "a sweep-net," is taken from the Arabic *shabekah* and *shabakah*, "a net," and the latter was originally, no doubt, exclusively applied to fishing-boats. The author would find it difficult to prove his assertion that the Greeks substituted their *x* for the Arabian *s*. Why should they? Had they not *sigma*?—F. S.]

* Pliny, speaking of one of the Magi, observes, "Navigare noluerat, quoniam exspuere in maria, aliisque mortalium necessitatibus violare naturam eam, fas non putant." (Nat. Hist. l. xxx. c. 2.) Among the Parsees of Persia a like prejudice exists, "For, say they, in the water the light is visible;" yet these people emigrated by sea, and are now the first ship-builders and merchants in the East, though still not navigators.

these vessels belonged either to the Indians or to the Arabs. Now the historians of Alexander have not recorded anything which would lead us to suppose that the Indians, as far as they had seen them, were a seafaring race, or that there was any intercourse by sea from the parts of India they had visited. On the contrary, we find that nothing could be learnt, regarding the navigation from the Indus to the Gulf, and that Nearchus was obliged to sail without a pilot; and it is very unlikely that, if after this, he had found Indian vessels in the Gulf of Persia, a circumstance so calculated to attract his attention, should have escaped being mentioned, and largely commented on. From all which, I think we may reasonably infer that they belonged to, and were manned by, not the people of India, but the maritime tribes of the coasts of Arabia.*

Not many years subsequent to this period, Agatharchides, who wrote in the time of Ptolemy Alexander, makes mention of great ships in the ports of Sabæa, which traded to India; whether these vessels were the carriers of the trade between India and Egypt, or whether the ships of the Ptolemies crossed the Indian Ocean, we cannot ascertain. It seems however unlikely, I should almost say impossible, considering that nothing is recorded on the subject,† that the Greeks were at that time in the habit of regularly visiting the shores of India. For Strabo, as has been shown, could learn but little with certainty on the subject; and Pliny, who wrote about eighty years afterwards, says that a knowledge of the southern parts of India was then only beginning to dawn on Europe; and his information appears to have been acquired in a great measure by means of the discovery of Hippalus, a Greek navigator, who communicated, in the reign of the Emperor Claudius, an account

* In offering these remarks I do not wish to argue, that, in the time of Alexander, a maritime communication was not carried on between Arabia and India. My only object is to show that there were, in his days, vessels in the harbours on the north-east of Arabia, which most probably belonged to the Arabs, and that all we can learn from the historians of the expedition does not lead us to suppose that the people of India were a seafaring race.

† Strabo was on the Red Sea, in the early part of the first century of our æra, yet his information regarding India was very imperfect, which could hardly have been the case if the Egyptians and Greeks had been in the habit of going themselves to those parts of India, in which the articles they imported were produced. He makes mention of a fleet at Myos Hormus of 120 vessels: these, I suspect, went no farther than to some emporium on the coast of Berberah or Arabia Felix, where they received the products of India, many of which they therefore supposed to be natives of those countries. Hence we find a "cinnamomifera regio" on the coast of Zangibâr and elsewhere, when we know that the cinnamon to which they allude was of that species which is only to be found on the island of Ceylon. It is true that Strabo talks of a fleet, belonging to Alexandrian merchants, sailing to India, but in the same page he tells us that this was subsequent to the expedition of Ælius Gallus, who led a Roman army along the coast of Arabia, reducing the country as far as Yemen, before which, he says, but few vessels ventured to India. Even of this fleet, however, many of the vessels may have belonged to the Arabs.

of the direct passage from the Red Sea to Ceylon,* and the coast of Malabar, by means of the monsoons. I am, therefore, led to suppose, that up to this time the intercourse with India was carried on chiefly, if not entirely, by the Arabs.

From the period at which we have thus arrived, the accounts of the foreign intercourse with India begin to assume a more historical form. Hitherto we have seen, that although there is no doubt of the trade with India having subsisted for centuries, we cannot determine with any degree of certainty by whom it was carried on: we are told, however, that the Arabs were a trading and seafaring race, and that they had vessels in the Persian Gulf, and on the coast of Sabæa; and we cannot suppose that, had there been in the Red Sea, or in the harbours of Arabia, vessels navigated by foreigners from India, such a circumstance would have escaped the observation of the Greek geographers, of whom Timosthenes, Eratosthenes, Agatharchides, Strabo, and others, were actually on that sea. So far, then, the argument may be regarded as in favour of the Arab navigators; and this view of the case is strongly supported by the first really historical account of the south of India, as given by Pliny, who tells us that, eighteen centuries ago, the Arabs were settled in such numbers in Ceylon, that they had established their religion on the coasts of that island. This is confirmed by Ptolemy in the second century of our æra, and three centuries afterwards by Cosmos Indicopleustes,† who wrote on the authority of a Greek named Sopater, who was in Ceylon about the year A.D. 500. The Arabian voyages in the ninth century, published by Renaudot, also bear testimony to the intercourse of the Arabs with the Malabar coast, as do Marco Polo in the thirteenth, and Nicolò de' Conti in the fifteenth century of our æra, at the

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* It has been supposed by some, that the Arabs were acquainted with the direct route from the Red Sea to the ports of Malabar before the time of Hippalus. If there is any truth in the traditions of the ancient or black Jews of Malabar, that they are the descendants of the half tribe of Manasseh, who were driven out of Israel by Nebuchadnezzar, king of Babylon, this route must have been known and followed many centuries before the age of Hippalus. For had their voyage been alongshore, it is most improbable that they would have gone so far as Cranganoor, in Malabar, before they found a place to settle at. Of the direct route in the first century we have further intimation in the records of the Christians of St. Thomas, and the white Jews of Cochin, both of whom maintain that their forefathers came to India nearly 1800 years ago, those of the former about fifty-one, and of the latter sixty-seven years after the birth of Christ. The Christians also speak of their voyage having been *viâ* Yemen and Socotra. Of the truth of these records, the testimony of St. Jerom, who died A.D. 420, is a very strong evidence, inasmuch as it proves that, at the time in which he wrote, it was a general belief in the churches of Europe, that Thomas the apostle had preached the Gospel to the people of India. (S. Hieron. Oper. Venetiis. 1766, 4to. Epis. i. v. 10, ad Marcellam.)

† In the reign of Hwang-te, A.D. 147, the Arabs appear to have carried their discoveries as far as Canton, as we learn from the records of the Chinese historians, who describe them as the first foreigners who had come to China by sea from the south-west. (Gutzlaff's Hist. of China.)

latter end of which, the Portuguese found, to their great danger and annoyance, 15,000 Arabs settled at Calicut. When, therefore, these circumstances are taken into consideration; when we view the vast extent of the Arab settlements, and the diffusion of their language and religion to the eastward; when we regard their history as we find it preserved in the earliest records, and look at the people as we see them at this day, a restless and reckless nation of adventurers; and lastly, when we consider the peculiar institution of caste among the Hindoos, in which there is no caste of sailors or navigators;* we are bound to subscribe to the opinion of Chardin, Robertson, Vincent, and others, that the Arabs, and not the Indians, were in ancient times the great carriers of the Indian trade, and the first navigators of the Indian seas.

X.—*On Central America.* By Colonel Don Juan Galindo, Corresponding Member, Royal Geographical Society, London. Read 9th May, 1836.

[There are few parts of the habitable globe, accessible to our ships and our commerce, with which we are still so little acquainted as with the interior, as well as the shores, of Central America. It is the more singular, as this extensive isthmus offers a coast-line of upwards of a thousand miles to the Atlantic, and to the southward presents an equal extent bathed by the waters of the Pacific Ocean. Various causes, which need not be here stated, have combined to produce this ignorance of a country, whose geographical position is so highly advantageous: the works of Father Gage, in 1632, and of Don Domingo Juarros, native of Guatemala, in 1780†, although containing much that is important, are very meagre and unsatisfactory, whether we look for geographical, statistical, or commercial details.‡ 'Thompson's Visit to Guatemala, in 1825§,' by far the best work on this country, is our surest guide; but he only actually visited the city of Guatemala, and 'Roberts's Narrative' is too diffuse and general for our purpose.

Yet it is possible, at no very distant period, that this country, hitherto so little known, may become the 'highway of nations'—that the grand oceanic canal, which would cause a revolution in

* Most of these opinions are very unrestricted and decided. Thus Vincent, Perip. 435,—" And to conclude that if the precious commodities of the East found their way to the Mediterranean, as undoubtedly they did, the first carriers on the ocean were, as undoubtedly, the Arabs.' So Sir John Chardin,—" For the Arabians, the first navigators in the world, in my opinion, at least for the eastern seas," &c.

† Translated by Lieut. J. Baily, R.M., London, 1823, now resident in Salvador.

‡ In J. Haefkens' 'Reise naar Guatamala,' in 1829, and in his later work on Central America, published in 1832, will be found some useful information.

§ London, 1829.

the commercial world, may be undertaken, connecting the Atlantic with the Pacific, through the Lake of Nicaragua; and it would be an important service rendered to geography, would any person endeavour to ascertain the levels on this line of road, and the physical obstacles it would be necessary to overcome, to form a water communication. It is believed some such survey has been set on foot by the government, or by a company, of the United States: in the mean time, the only observations we have are from a Spanish MS. existing in the archives at Guatemala, and copied by Mr. Thompson, which states that the engineer Don Manuel Galisteo executed a survey, in 1781, by means of a water level, from the gulf of Papagayo in the Pacific, as far as the Lake of Nicaragua; and that, by 347 levels, at about one hundred yards apart, the surface of the lake was found to be elevated 133·11½ feet above the sea; but the lake is said to be fifteen fathoms deep, so that its bottom is still forty-six Spanish feet* above the level of the South Sea. The distance between the lake and the sea, at the proposed communication, is, by this measurement, only 29,880 English yards, or fifteen geographical miles nearly, and the greatest actual height of any part of the land is nineteen feet above the level of the lake: thus we are assured of a grand natural reservoir of water, at a sufficient elevation; but the practicability of a communication with the Pacific, either by this line or through the Lake of Leon; or with the Atlantic by the Rio San Juan, or some great transversal valley, is not yet ascertained with any certainty. The coast line of this country has hitherto been very imperfectly laid down on our maps; but the recent survey, by Captain Owen, R.N., now in progress, will doubtless remedy this for the northern coast. Commencing at Cape Catoche, the north-east point of Yucatan, the survey has been continued down the coast of Honduras, and along the Poyais shore to Cape Gracias a Dios, thence to the southward, along the Mosquito shore, as far as the mouth of the Rio San Juan. So far is correctly ascertained: an interval of 250 miles occurs between this point and Porto-Bello, which the Spanish surveys have come down to from the eastward. For the coast-line towards the Pacific we have no recent surveys; and there is little doubt that the greater part of it is incorrectly laid down; but the survey of Captain Beechey, R.N., now in progress on the coast of Peru, will, ere long, it is expected, reach this shore also. The outline of the country correctly obtained, we hope gradually to fill up the interior by observations of enlightened natives and travellers; and the description of Costarrica, by Colonel Galindo, our zealous corresponding member, annexed to this paper, the result of many years' travels and inquiries, is the first of a series of the different

* 1 Castille foot equals 0·9267 of an English foot.

states composing the federation, which he has kindly promised, on his return to his country, successively to transmit to the Geographical Society.—Ed.]

America may naturally be divided into four grand portions: North America, Central America, South America, and the West Indies.

Central America comprehends the five states of Costarrica, Nicaragua, Honduras, Salvador, and Guatemala, united in one federation, and whose seat of government is at the city of San Salvador, within the federal district; it also includes the territories of the Mosquito men and their subordinate tribes of Indians.

This country is bounded on the north by Mexico and the bay of Honduras, on the east by the Caribbean sea and Veragua, and on the west and south by the Pacific ocean.

The principal points of the boundary towards Mexico are the ruins of Palenque,* the river Nojbecan in latitude 19° north, and the Rio Hondo. Towards New Granada the river Escudo of Veragua, which falls into the Caribbean sea, and the river Boruca, which runs to the Pacific.

The most noted of the Central American islands are those on the eastern coast of the state of Guatemala, besides Ruatan, la Guanaja, and Utila in the bay of Honduras; the archipelago of Chiriqui in the Caribbean sea; Cocos and the islands of the bay of Conchagua on the South.

By a glance at a map of Central America, it is perceived to be an extended strip of land stretching from the north-west to the south-east, separating the waters of the Atlantic from the Pacific, and connecting the two vast continents of North and South America. The natural limits of this portion of the earth are certainly the narrowest part of the isthmus of Panamà on the one hand, and the isthmus of Tehuantepec on the other, but I confine myself to its political boundaries.

That elevated range, forming the spine of the whole continent, styled in South America the Andes, and in the United States the Stony Mountains, may be traced throughout Central America, though at a minor elevation than in the two adjoining continents, dividing this country into two grand portions; the waters on the north of the ridge falling into those of the Atlantic, and the sources on the south running into the Pacific. In proportion to the breadth of the territory of the federation, this spinal range approaches to the Atlantic and recedes from the Pacific in Central America to a greater degree than in any other part

* More correctly speaking the ruins of the nameless city or cities, near the village of Palenque. Palenque is simply a Spanish term signifying, palisade or wooden enclosure.—Ed.

of its course from Cape Horn to the Arctic ocean;* yet, even here, in no point is the ridge nearer the northern than the southern shores of the continent, and the slope from the summit of the mountains to the sea is consequently more abrupt towards the Pacific than to the Atlantic.

The same elevated range which in Central America has no determined name, and is even in many parts without a visible existence, commences in Costarrica at a distance from the Pacific of about one-fourth of the whole breadth of the isthmus, and at the beginning of its course separates this state from Veragua; in Nicaragua it inclines close to the borders of the Pacific, leaving the lakes on the east; in Honduras it returns towards the Atlantic, and, with Danli and Sedros on its summit, it leaves Comayagua on the north, with Tegusigalpa and the whole state of Salvador on the south;—traversing Guatemala, the new city and Chimaltenango stand on the top of the ridge, which now becomes more elevated as it approaches Mexico, and branching into various groups, forms, in the western part of the state, that region which is denominated the highlands, and in which are situated the cities of Totonicapan and Quesaltenango. The population on the Pacific side of the chain is much greater in proportion to its extent than on the Atlantic slope.

This range of mountains may almost be said to be interrupted in its course through Central America by two transversal valleys, in one of which is contained the lake of Nicaragua, and in the other the plain of Comayagua; but this interruption is more apparent than real, for to the southward of the lake there certainly exists an elevation which separates its waters from the Pacific; and in the extensive valley of Comayagua, the only one of the union which runs north and south, there is decidedly a central eminence, on each side of which the waters drain off to the respective oceans.

The base of the range is skirted by a fringe of alluvion, though in some spots its branches reach to the sea-shore. Yucatan and the British settlement of Honduras are principally of alluvial formation; while to the southward and eastward the mountains approach the bay of Honduras, and at a considerable elevation bound it as far as the Mosquito shore, when they again recede into the interior. Nearly the whole coast of the Pacific is bordered by an alluvial plain, varying in breadth, and the line where this plain joins the base of the range is crowned by a continual succession of volcanoes, at different distances and of various elevations: many of these volcanoes lift their lofty summits far above the height of the central ridge, and there are even some mountains, like that of Ule, in the southern part of Honduras, of a greater altitude than the mother chain.

* Except in Mexico.—Ed.

The elevation of the surface of Central America is the cause of the cool and temperate climate of the greater part of its extent, the tropical heats being only experienced immediately on the sea-coasts and the banks of the navigable rivers; in the rest of the country a perpetual spring and verdure ever exist, and realize the dream of the ancient European poets, who, without experiencing it, imagined a similar climate for their favourite Elysian fields and the island of Calypso.

I need not remark that, according to the greater elevation of a district above the level of the sea, so much cooler is the temperature; and, although the height of the mountains of Central America is much less than that of the Andes and their branches in the southern continent, yet, I repeat, the major part of its surface is greatly elevated above the level of the oceans. But the principal altitudes in the confederation are its volcanoes, which are scattered along our southern shores at various distances from the Pacific, but are not met with in the north or east. The most remarkable volcanoes are Tajumulco, Atitan, Fire, Water, Pacaya, Isalco, San Salvador, San Vicente, San Miguel, Cosigüina, el Viejo, Ometepe, Irasú, Turrialva, Chirripó, Barba, Votos, Erradura, and Miravalles. The water volcano is the loftiest, its summit being 12,620 feet above the level of the Pacific: this has never emitted fire from its crater, but torrents of water and stones. Various other volcanoes of Central America have, at different periods, had many considerable eruptions of fire as those of other countries. That of Cosigüina was described in Vol. V. of the Journal. The volcano of Isalco is at present in the greatest state of activity, but without doing any damage.

These volcanoes are vulgarly supposed to be the great causes of earthquakes; as their vicinity is always peculiarly afflicted with such commotions, yet invariably the neighbourhood of every volcano is thickly peopled. Ometepe is the only inhabited island in the lake of Nicaragua, at the same time that it is the only island of the lake on which is found a volcano.

The ports and navigable rivers of Central America are among its great advantages over Mexico, which throughout the whole extent of its eastern shores does not possess a harbour worthy the name; while the coasts of this country are indented by deep and capacious gulfs, and it contains excellent ports on both seas.

The principal lakes of Central America are Nicaragua, Managua, Golfo Dulce, Golfete, Peten, Atitan, Amatitan, Güija, and Cojutepeque; the five former are situated in the northern slope, the four latter lakes lie in the plane that inclines towards the Pacific.

The Usumasinta, of which a description is to be found in Vol. III. Part I. of the Journal of the Royal Geographical Society, falls into the bay of Campeachy.* The Hondo, Belize, Sarstoon,

Polochic, Motagua, Ulua, Lean, Aguan, Black, Plantain, and Patook rivers, discharge their waters into the bay of Honduras; the Wanx,* San Juan, Matina, Culebra, and Escudo of Veragua, run into the Caribbean; the Boruca, Tèmpisque, Choluteca, Nacaome, Guascoran, San Miguel, Lempa, Pasa, Esclavos, Michatoya, Guacalate, Gicalapa, Samala, and Tilapa, contribute to the Pacific; many of these rivers are navigable for several miles into the interior, and there are numerous others of less note. The country also abounds in warm and medicinal springs.

The gold mines of Costarrica, and the silver of Honduras, are rapidly increasing in their products.

The great staples of the federation, and its principal articles of export, besides the precious metals, are indigo, cochineal, sarsaparilla, hides of various animals, mahogany, cedar, dye woods, balsam, sugar, and rapadura, or panela: the latter is a species of brown sugar principally used for the distilling of spirits.

The various vegetable productions of Central America in its cold, temperate, and warm climates, prove the advantageous scale of altitudes in this country: its horticultural productions and fruits embrace nearly all those of Europe and the West Indies, besides various others very valuable, entirely peculiar to its own soil. I have forwarded at various times collections of the indigenous seeds to the Horticultural Society of London.

Two species of locusts are remarkable in Central America, the brown and the green: the brown locusts have at various times appeared in immense flocks, covering everything green: as they never fly very high, the country people have a method of destroying them by driving them into pits; the Asacuan, a bird of the size of a pigeon, and whose flight denotes the seasons, also pursues them in large numbers to devour them: the story told that the green locust or chapuli produces the seeds of plants, I have often heard repeated, but cannot give credit to it.

The seas of Central America abound in pearls, tortoise-shell, whales, &c.

The birds of the country are deservedly celebrated for their great variety, and the extraordinary beauty of their plumage; the handsomest and most remarkable is the quesal,† or *Trogon resplendens*,‡ which is rarely found in other parts of America, but abounds in Verapas and Quesaltenango. All the kinds of fowls of the European poultry-yards are reared in Central America, including geese, notwithstanding Humboldt states the contrary.

Cattle, horses, asses, sheep, goats, and hogs, though not indi-

* Huanx according to the Spanish orthography.—Ed.

† *Quetzalli*, in the Toltec language, implies green feather, and the name of the celebrated Toltec deity, *Quetzal-coatl*, is probably derived from an association of this bird and the serpent *Coatl*.—Ed.

‡ For a description of this beautiful bird, the *Trogon resplendens*, see Gould's 'Monograph.'

genous to the continent, having been introduced by the Spaniards, are now found here in abundance and perfection. I may remark, that although the horses of this country are not a good race, yet the mules are of a very superior breed. The woods and mountains contain some wild animals, but none very fierce or powerful; the most remarkable are tigers and wolves. The zorrillo is a small fox, whose water is extremely offensive; it stupifies, and has been known to cause the death of a dog that had killed it; the same water leaves a blue dye on every beast, and on everything it comes in contact with.

The territory of the confederation in a direct line from the north-west extremity of the state of Guatemala, to the south-east of Costarricca, is 900 geographical miles in length; the breadth varies from 80 to upwards of 300 miles. The extent of its surface may be computed to contain about 200,000 square miles. It lies entirely within the north torrid zone, and extends over 10° of latitude from 8° to 18° north; its population may be estimated as follows:—

Costarrica	150,000
Nicaragua.	350,000
Honduras	300,000
Salvador	350,000
Guatemala	700,000
Federal District . . .	50,000
Total of Central America	1,900,000

besides the Mosquito men, and their tributary Indians.

In proportion to its extent, Central America is the most populous nation of the Continent, the United States not excepted. This population is divided into the four grand castes of Indians, Whites, Blacks, and Ladinos, or Mulattoes,—a mixture of the other three; the relative number of these classes may be approximated to as follows:—

	Indians.	Whites.	Ladinos.	Total.
Costarrica. . .	25,000	125,000	..	150,000
Nicaragua. . .	120,000	110,000	120,000	350,000
Honduras . . .	..	60,000	240,000	300,000
Salvador . . .	70,000	70,000	210,000	350,000
Guatemala . .	450,000	100,000	150,000	700,000
Federal District .	20,000	10,000	20,000	50,000
	685,000	475,000	740,000	1,900,000

The number of blacks in Central America is too inconsiderble to be taken into consideration. It must also be remarked hat the ladinos of this country cannot be assimilated to the Vest Indian mulattoes, as their complexions are much fairer, and

many are little distinguishable from the whites. The Indians of the state of Guatemala preserve to a great degree their aboriginal languages and customs; but, in the other states, they speak the Castilian, and are blended in their manners with the mass of the population. The jealousies among the castes are balanced by the Indians being well attached to the whites and very averse to the ladinos, while the constitution offers equal rights and privileges to all.' An extraordinary excess is observable in the births of white and ladina females over those of the males, the former being, in proportion to the latter, as six, or at least as five to four: among the Indians, the births of males and females are about equal.

The cities of the federation are twenty-nine in number; the first is San Salvador, the residence of the general government in the federal district, which is a circle round the city twenty miles in diameter, with a farther extension of ten miles towards the south, to include the roadstead of Libertad on the Pacific.

The cities of Costarrica are San José, Carthage, Esparsa, Alajuela, Eredia, Estrella;—of Nicaragua, Leon, Granada, New Segovia;—of Honduras, Comayagua, Tegusigalpa, Grasias, San Pedro Sula, Olanchito, Sonaguera, Trugillo;—of Salvador, San Vicente, San Miguel, Santa Ana, Sonsonate;—of the state of Guatemala, Guatemala, Old Guatemala, Totonicapan, Quesaltenango, Chiquimula, Salamá, Coban, Flores.

The principal ports in the bay of Honduras are Isabal, Omoa, and Trugillo; in the Caribbean Sea, San Juan de Nicaragua, Moin, and Bocatoro; and in the Pacific, Calderas, El Realejo, La Union, Libertad, Acajutla, and Istapa.

The cities, towns, and villages have municipalities, whose members are annually elected, and the alcaldes or chief justices preside.

The states are each governed by a chief.

The constitution of Central America provides that the legislative power shall be vested in a federal congress, composed of deputies elected in the proportion of one to every thirty thousand inhabitants, and half the members are re-elected annually. The senate, which here is not considered a house of congress, is a permanent chamber; it has the sanction of the laws, and acts as a council to the President; it consists of two members from each state, and one-third of the senators are re-elected every year. The executive power is lodged in a president elected for the term of four years, as well as the vice-president. The ministers of state, appointed by the President, are three; one for the foreign and home departments, another for finance, and the third for war. The supreme court of justice consists of six members, one-third of whom are re-elected by the people every two years. It must, however, be remarked that no elections in Central America

are made directly by the people, but by the medium of electoral colleges, as in France. Chile is the only republic of late Spanish America that has adopted the English system of direct elections.

Central America, though the fourth nation of the western hemisphere, derives her chief importance from her geographical position and the liberality of her institutions. The monkish orders have been wholly extinguished, and the few nunneries that remain cannot compel their members to stay in them against their will.

The independence of Central America was finally attained on the 1st of July, 1823, and the preceding constitution was adopted. An anti-national party, however, long strove for mastery; and the last Spanish flag that will ever float over the western continent was lowered in Omoa on the 12th of September, 1832. The president, General Francisco Morasan, has been elected to a second term of four years: his fortune, moderation, and sacred respect for the institutions of the country promise a prosperous period; in short, it may be confidently predicted that the internal troubles of Central America have for ever terminated. These have been very ruinous to the advance of Nicaragua and Salvador; but the other three states are rapidly progressing in the career of good government, industry, and wealth: that of Guatemala, from the tranquillity it has for many years enjoyed, and the greater intelligence of its leading men, is most forward in the race of improvement. In this state the Spanish laws have been entirely abolished, and the code of Mr. Livingston, of the United States, substituted in their stead. Education is fostered by every means.

The national coat of arms is a range of five volcanoes on a plain washed by both oceans, with a rainbow above, and the cap of liberty beneath, surrounded by a glory. This is enclosed within a triangle encircled by a label with the inscription—"*Federacion de Centro America.*"

The flag consists of three horizontal stripes, (blue, white, blue,) with the arms in the centre, except in merchant vessels, where the arms are replaced by an inscription, in silver letters,—"*Dios, Union, Libertad!*" With these three words, also, all despatches and official letters are concluded.

COSTARRICA.

The state of Costarrica is one of the five composing the Central American Confederation. It is bounded by Nicaragua on the north, New Granada on the south, the Caribbean Sea on the east, and the Pacific Ocean on the west. Its most eastern point is the left bank of the river Escudo of Veragua; its northwestern extremity the little village of La Flor, on the Pacific;

its north-eastern the Colorado mouth of the river San Juan; and its most southern limit is the right bank of the river Boruca, which falls into the Pacific.

The physical aspect of Costarrica is very uneven, and the face of the country is at various levels above the ocean, which, according to their height, have different temperatures and productions.

There are two principal forests in the state; that of Aguacate is remarkable for its rich gold mines, which began to be worked about 1821, and having, from their riches, attracted the attention of foreigners and the citizens of the other states, their immigration and settlement here have been of great advantage: these circumstances, with the present freedom of commerce, have completely vindicated Costarrica from the ironical aspersion cast on it before the independence by the Reverend Domingo Juarros, of Old Guatemala, and which at that time was too true. The second forest of note is that of Dota, of great extent, and through which the road passes from San José to the towns of Terrava and Boruca, and from thence into the republic of New Granada, in South America.

The volcanoes of Costarrica are Irasú, or Carthage, Turrialva, and Chirripó, in the Oriental department; Barba, Votos, Erradura, and Miravalles, in the Occidental.

Near the volcano of Chirripó occurred a remarkable earthquake on the 7th of May, 1822, about half-past one in the morning: there were two shocks, the latter presented some very remarkable phenomena; it commenced by an undulation from east to west, which was followed by a vertical motion, and then again the undulation as before: many edifices were cracked by it; the top of the portico of the Carthage church, and the cupola of one of the towers of the church of San José were thrown towards the westward, yet not a single individual was hurt. In the valley of Matina, which is to the east-north-east of San José, were found crevices of various dimensions, and some of them very considerable, from the bottom of which sand and salt water were thrown up.

The volcano of Irasú, or Carthage, is celebrated in the history of Costarrica, on account of the dreadful phenomena of its first eruption, which happened in 1723: it was accompanied by strong and frequent earthquakes, and a dark fog, which lasted three days, the darkness rendering more apparent and terrific great masses of fire, which at the same time floated over the city of Carthage, and fell at a considerable distance beyond.

In order to make a more perspicuous description of the principal rivers of the state, it is necessary to observe that there is a point called Alto de Ochomogo, near the hill of Quircot, close to Carthage, whence the waters separate, which run through the principal part of the state, and discharge themselves respectively into the Pacific Ocean and the Caribbean Sea; so that we may

consider Costarrica as divided into two parts, namely, the north-eastern and south-western, it being understood that this point is not only remarkable for the separation of waters, but also by its temperature it announces to the attentive traveller that he is, when on that height, upon the dividing line between the two great sections of territory into which nature has divided the state. The south-western slope is easily accessible, gradually inclining, nearly throughout its whole extent, from the genial temperature which favours vegetation and relieves man in his daily labours, to the insupportable heat and aridity which announces languor and sterility. On the north-eastern side, on the contrary, the aspect is more rugged, and nature appears as if she wished to display her power by placing at every step difficulties, wonders, wrecks, and ruins; everything here is great: the number, complication, and height of the mountains, the large rivers, and even the smaller ones, excite the fear and attract the attention of the traveller, who considers their capacious channels, which they fill in winter, carrying along with them immense rocks by their impetuous current, as also the largest trees broken and scattered here and there, and borne away with masses of earth torn by the waters from their lofty shores. Inaccessible heights, deep abysses, beautiful and delicious plains, everything is found full of fertility and abundance, from the most elevated peak to the shores of the ocean.

The river Salto, or Alvarado, on being joined by other streams, forms the large one of Tempisque, which runs into the bay of Nicoya.

The river Grande, which may be said to form the limit between the pastoral and agricultural districts, as also a barrier to impede the easy access of the traveller to the most populous part of the state; after a tortuous and rapid course, broken by rocks, discharges its waters into the eastern part of the same bay of Nicoya, very near the Erradura.

The river Costarrica (formerly called San Carlos) runs into the river San Juan.

The Sarapiqui forms the principal route from the interior to the Caribbean Sea.

The river Ucus, or Macho, runs under this name for many leagues, then takes that of Reventason, and under the latter falls into the Caribbean Sea, after having collected a great body of water in its course, which pierces one of the two principal chains of our mountains; its current is of furious rapidity, and a great obstacle in the road leading to Matina, threatening ruin and destruction to travellers and their baggage.

The Matina is formed by the rivers Chirripó and Barbilla, which join at the point called Real; from whence commences, and continues down the course of the stream, the territory called

Plano, or Seccion, de Bonilla. It must be observed that the rivers Chirripó and Barbilla are navigable before their confluence to form the Matina, and that the Chirripó is commonly larger and more rapid than the Barbilla, though the latter in the rainy season has more water, and is smooth. The territory which has always been known by the name of the Valley of Matina is not precisely determined; but it may be said that it extends from the Madre de Dios river to near the mouth of the Matina, and is divided into three principal parts, viz., the Plano de Bonilla, Bejuco, and Aspe. The Matina is a tranquil stream, without any rocks throughout its whole extent: its periodical inundations leave a deposit of vegetable mud or alluvion. The only easy access to the sea, or alongside the vessels in the port of Moin, for boats, is by the canal of the Baya. The inundations of the valley of Matina are generally in the months of December and January, but sometimes in November, February, and even in March. The cause of the phenomenon appears to be the advantageous elevation above the level of the sea of the eastern part of Costarrica, which thus enjoys, to a certain degree, the winter of the north temperate zone; so that in this season, which begins to be felt in December in the north-eastern part of Costarrica, cold, more or less, is experienced, so much as several degrees below the freezing point, and winds and rains. Hence the necessary result that the rivers which rise in the mountains are swollen in proportion to the rains, and according to the progress of the winter and seasons in the temperate zone. With respect to the swelling of the rivers it may be remarked that, on the Barbilla joining the Chirripó, the former cannot easily discharge itself into the latter, and consequently it rises and overflows into the natural ravines and low grounds of the valley, whence the partial inundation observed on one side of the Matina. But if this rise be considerable, and last for any time, the Chirripó also is caused to overflow its banks; whence proceeds the general inundation on both sides of the Matina, which commonly lasts twenty-four hours, and sometimes, but not often, thirty-six, or more: it generally happens in the night-time, although the rain which produces it begins in the afternoon. The oldest traditions testify that the inundation happens only once a year, whether whole or partial. The morning of the inundation the atmosphere appears loaded in every direction, and frequent storms of rain pass over the valley; these announce its approach, and warn the inhabitants to prepare for it, and the injuries it may occasion, according to its height; which, in the more elevated parts of the section of Bonilla, never exceeds nine feet, and, in extent, at a day's journey from the middle of the Plain of Bonilla, traces of the inundation have been seen. At the angle of the confluence of the Chirripó and Barbilla there is an elevated spot to which the inundation never rises, being a

central point between the plains of Bonilla, Bejuco, and Aspe, and at the upper extremity of the lands fit for grazing cattle. On this elevated spot it is proposed to found a town, which may preside over the agricultural and pastoral industry of the surrounding country. The inundation leaves usually a deposit of mud three or four inches thick, so that the surface of the valley is much higher now than formerly; and perhaps this is the cause of a phenomenon observed by the people of Matina with pleasure, the oldest of whom say that for many years the inundations are not so great as their ancestors used to speak of; and all are unanimous in stating that they become less every year. They are of immense benefit to vegetation, causing its greatest luxuriance and splendour; and they also destroy the moles, an animal so prejudicial to all plantations, but especially to those of cacao: it is further said that no unhealthiness arises from the inundations. The small plaintain has become in the cacao estates the best and most advantageous substitute for the black wood, since the latter, besides occupying too much space, often causes injury by falling and crushing a great many cacao-trees.

The Baya is a canal, which commences at the port of Moin, or Salt Creek, and, running parallel to the sea, is crossed by the rivers Matina, Pacuare, Reventason, and Cacao, which latter stream falls into the Tortuguero; the Baya continues parallel to the coast as far as Pearl Kay Lagoon, a distance of 180 miles from Moin, being, however, stopped up in a few places. Some believe that this canal is a work of nature, and others that it was cut by the aborigines for the purpose of opening a commodious passage and inland communication, avoiding the many dangers of the surf and the bars at the mouths of the rivers. Boats and canoes can come by the Baya from Moin to the river Matina, near its mouth; and up the stream of this river, through the whole section of Bonilla, to the Real; and from thence up either the Chirripó or Barbilla, since they are both navigable; so that the valuable wood on the banks of these rivers can go to Moin in rafts. The Baya is from twenty to twenty-five yards wide, and both it and the river Matina are susceptible of being navigated by steam-boats.

The Chrico Mola, or Chrickam Aula, falls into the bay of Chiriqui; it is navigable about twenty-five miles from the sea; the climate of its banks is delightful, and the surrounding country contains inexhaustible provisions in a wild state, such as plantains, peccaries, &c.

The river Escudo de Veragua, which divides Central from South America, runs into the Caribbean, opposite the island of the same name.

The Banana, Tiribee, and Culebra rivers, also fall into the Caribbean, between Bocatoro and Salt Creek.

The state of Costarrica is divided into two departments, each comprehending five partidos, or districts, Carthage being the chief city of the Oriental department, and Alajuela of the Occidental viz.:—

Oriental Department.

Districts.	Cities.	Towns.
Carthage . .	Carthage . .	Union. Cot. Quircot. Tobosi.
San José . .	San José . .	Curridavat. Aserri.
Paraiso . . .	. .	Paraiso (c). Orosi. Tucurrique.
Terrava . . .	. .	Terrava. Boruca.
Morasan . .	Estrella . . .	Bocatoro.

Occidental Department.

Districts.	Cities.	Towns.
Alajuela . .	Alajuela . .	. .
Eredia . . .	Eredia . . .	Barba (c).
Escasu . . .	. .	Escasu (c). Pacaca.
Cañas . . .	Esparsa . . .	Cañas (c). Bagases (c).
Santacruz . .	. .	Guanacaste (c). Santacruz. Nicoya.

Those marked (*c*) are corporate towns. The city of San José is the capital of the commonwealth.

The sea-ports of Costarrica are San Juan del Norte, (commonly called of Nicaragua,) Moin, and Bocatoro, in the Caribbean; Mantas, Calderas, and Culebra, on the Pacific Ocean.

The lakes of Costarrica are Socorro, at the head of the brook of Reventado, which supplies the city of Carthage with water; the twin lakes at the place called Laguna, on the road from San José to the Matina; Ermoso, near the road from Barba to the Sarapiqui; and Surtidor, at the source of the latter river.

The principal productions of Costarrica are cattle, hogs, goats, and sheep. In the forests the tapir, the mountain cow, the wild goat, the wild striped boar, the zahino, and other wild quadrupeds. The sugar, wild and white, cane, and that of the class

called birota, which, spread out, forms strong planks more than half a yard wide, and five or six long. Coffee, (which, being properly plucked and dried, is similar to that of Mocha,) three sorts of cacao, or chocolate, indigo, vanilla, three sorts of maize, seven kinds of French beans, peas, beans, rice, wheat, musk, and water-melons. In a word, innumerable medicinal plants, and all the cereal, so that botany would find amongst us a vast field in which to range with unspeakable advantage to humanity and society in general. Three sorts of plantains, three of cotton, tobacco of many kinds; timber for mills and other works which require hard woods, such as guapinol, the lignum-vitæ, the wild medlar-tree, and the oak. For houses and joiners' work, mahogany of the best quality; the casique, the cocoa-nut-tree, the ronron, and the cristobal; the beech-tree, three sorts of cedar, the caragra, (which, from very recent observation, is considered the best substitute for cedar,) the chestnut, the espavey, (also called the espavel, or agüegüe,) and the laurel. For house props, as not rotting in the earth, the chirraca, the tubus, the baynilla, the guachipelin, a very strong wood, the quiebrahacha, the black wood, the comenegro, which is the same as the iron tree, so celebrated in the East Indies and other countries. Lastly, dyewoods, such as are called Brazil and Nicaragua, found on the coasts of the Pacific and Caribbean; the San Juan, of a beautiful yellow; Poro, from which is extracted a very bright yellow cane colour; and, above all, the wild *Annona reticulata*, which has the particular property of its wood being perfectly white, but, when cut or split, in a few minutes turns to a clear and brilliant red colour, which can be extracted, and which is quite durable; balsam cavuna, or canune, copaiva, and tolu and cativo. The gums copey, resin, copal, arabic, quitirri, guapinol. (an excellent perfume,) incense, chirraca, and that of the chestnut-tree, whose fruit contains much oil, and of which candles are made very like yellow wax, burning with a good, clear, and steady light, without giving out much carbon; this seed and substance, being worked and purified, make candles as fine as those of white wax.

The most remarkable fish is the bobo, which is only found in the rivers running into the Caribbean, and especially in the eastern part of Costarrica: it is very lively, and will not bite at any bait on a hook, on which account it can only be caught in a net, or shot with arrows, which is done by the aborigines with great skill. Its flesh is delicate, and it has no other bone but that in the back.

The otter and the manati are found, and almost all the rivers are abundant in many species of fish.

The three kingdoms, animal, vegetable, and mineral, have been little explored in Costarrica, and particularly the latter, since we have only just discovered that we possess zinc, nickel,

antimony, with gold, silver, copper, iron, and lead, although up to the present time there is not a single mine of the two latter metals worked. With respect to gold and silver we have the mines of Aguacate, which have produced great riches since their discovery; these metals have also been found in all the mountains that have yet been examined, and, above all, in that of Tisingal, near the ruins of the old city of Estrella, situated in one of the excellent harbours of the archipelago of Chiriqui. The immense riches of this mine, and the circumstance of its being situated on the coast of the Caribbean, was the cause of this country being named Costarrica, or the Rich Coast.

The climate of Costarrica is as varied as its aspect; in the principal inhabited places it may be asserted that the climate is the finest in the known world, no extreme of heat or cold. Fahrenheit's thermometer varies between 50° and 76°; but, including all places reduced by agriculture or pasturage, the thermometer ranges through every degree, from freezing point to 100°, in proportion to the elevation above the level of the sea. This day, the 13th of April, 1834, Fahrenheit's thermometer is at 96° in Caldèras, and there are many places at a short distance from Carthage, and in other parts, where the cold is so intense that it frequently happens that running waters are found frozen in the morning, and the inhabitants, principally those who reside in Carthage, San José, and Eredia, enjoy the luxury of ice; so that the territory of Costarrica can produce all the fruits and productions of every climate in the world.

The Indian tribes within the territory of Costarrica, distinguished by the name of *Parcialidades*, are the Valientes, or most eastern people of the state; the Tiribees, who occupy the coast from Bocatoro to the Banana; the Talamancas and Blancos, who inhabit the interior, but frequent the coast between the Banana and Salt Creek; the Montaños and Cabecares, who are settled in the neighbourhood of the high lands bounding Veragua, and the Guatusos, inhabiting the mountains and forests between Esparsa and Bagases, and towards the north of these places.

The Blancos are in constant communication with the farmers of Matina: they are of mild manners, well-formed men, and whiter than the general copper-colour of American aborigines, and hence their name. Such is their honesty, that they are left by themselves in the farm-houses with a perfect security that they will steal nothing. The former hatred of all these tribes to the Spaniards and their descendants is now rapidly decreasing, through the liberal policy of the actual rulers of Costarrica and Central America in general.

The whole population of Costarrica amounts to 150,000, which is rapidly on the increase.

According to the eleventh article of the Federal Constitution,

complete toleration is the law of the state; the inhabitants are chiefly Roman Catholics; the Protestant faith prevails in the district of Morasan, and paganism among the aboriginal Parcialidades.

The government is divided into the legislative, executive, and judicial powers. The legislative consists in an assembly composed of twelve deputies, elected biennially, and with whom all laws are originated; and a council composed of three individuals, elected every four years, who have the right to sanction or reject all Bills. The executive power is intrusted to a single individual, with the title of Supreme Chief.

The fourth constitutional period is now about to expire, and the people of Costarrica have the glorious and enviable satisfaction of having annually exercised their sovereignty in electing their representatives and magistrates by their own free will. The pacific and industrious inhabitants of the state have, under the favour of Providence, profited by propitious events; and while the other states of this confederacy, and even the greater part of the new nations of America, have been devastated by wars and commotions, Costarrica has happily been preserved from them, and has gradually advanced in improvement.

The neighbourhood of Costarrica, at the mouth of the river Bethlehem, was the first part of the continent of America on which Europeans were settled by the immortal Columbus, in his fourth voyage in 1502; and though his intentions were subsequently frustrated by the hostilities of the aborigines, Costarrica was eventually the first permanent establishment of the Spaniards in Central America.

Under the captains-general, who first ruled this country, was founded, and afterwards destroyed, the famous city of Estrella; as also the large towns of Atirro, Chirripó, and Garavito.

Under the governors, who succeeded, happened the removal and re-establishment of the city of Carthage; the sack and destruction of the city of Esparsa, its population being removed to the port of Calderas; the intrigues of the directors of Boruca and Terrava; the ruin and desertion of Matina; and the removal of the tobacco plantations from New Segovia, in Nicaragua, to this state, from the cultivation of which we derive so much advantage and profit.

On the 27th October, 1821, Costarrica declared herself independent, and existed for a short time as a province of the Mexican empire; but on the formation of the Central American Confederacy, in the latter part of 1823, this state became an integral part of it, and on the 21st of January, 1825, adopted its present constitution.

XI.—*Account of a Voyage to explore he River Negro from its mouth on the East Coast of South America, to its supposed Sources in the Cordillera of Chile.* Communicated by Woodbine Parish, Esq., F.R.S.

[THE accompanying paper is extracted from the original journal of a Voyage of Discovery up the River Negro of Patagonia, performed in the years 1782-3, by Don Basilio Villarino, a Master Pilot in the Spanish Navy, by order of the Government of Spain. This river, which forms so important a feature in the geography of that part of South America, has hitherto been solely laid down upon the authority of old Father Falkner's work upon Patagonia, published in this country in the year 1775, whose account of it was derived from the Indians.

It was one of Falkner's objects to point out the facility with which, in his belief, the Spanish possessions in Chile might be reached by it, and surprised by any foreign nation choosing to disembark a force for the purpose upon the coast near its mouth; and his publication appears to have been the immediate cause of the Spanish Government sending out officers to survey the coast from the river Plate to the Straits of Magellan, and to form permanent settlements on such points of it as might secure the Spanish dominions in those parts from the chance of such surprisal.

The survey in question was commenced in December, 1778, and led to the establishment of settlements upon the river Negro; at Port San Joseph's, discovered for the first time in lat. 42° 13′, and of all others perhaps the most important point upon those coasts; at Port Desire; and at San Julian's, about a degree farther south; beyond which the river of Santa Cruz was also examined to its sources. All these settlements however were abandoned three or four years afterwards, excepting that upon the river Negro, which the Spanish Government kept up; and many families were sent out to it from Spain, whose descendants to this day form a considerable portion of the population.

The determination to maintain this settlement in preference to any other upon those coasts was no doubt, amongst other causes, in the expectation that it would lead to the discovery of an inland water-communication, not only with Chile but with Mendoza and the adjoining provinces, which might prove of vast importance to the people in those parts. Accordingly, no sooner was the settlement fairly planted than a voyage of discovery was planned to explore the Negro to its sources, and to examine the courses of those rivers which were reported to join it from the north, the command of which was given to Villarino, as the best qualified person then in those parts for such a service.]

On the *28th of September*, 1782, the expedition left the little settlement of Carmen, upon the river Negro: it consisted of four large Spanish launches, (chalupas,) to each of which

Sketch
of the State of
COSTARRICA
in
Central America
by
Col.^l Don Juan Galindo
1836

English Miles



was appointed a master, a carpenter, and caulker, besides a picked crew:—they were also accompanied along the banks by a sufficient number of peons, with horses, to assist in towing them against the current, and to reconnoitre the country as they proceeded.

On the *2nd of October* they were 11 leagues N.W. from Carmen, although by the windings of the river they had really gone double that distance.

On the *5th* they made 5 leagues more, W.N.W., having gone 12 by the course of the river.

On the *6th* they were only 2 miles from where they were the day before, although they made in the course of the day by the river 3 leagues.

It would be of little interest to recapitulate further the daily distances and bearings which will be found in a tabular form at the end of the paper, as they have been extracted from the original diary, to enable Mr. Arrowsmith to project the general map of the river which is annexed.

From Carmen to the Great Island of Choleechel, or Chuelechel, its general course trends to the N.N.W., though in some parts it is exceedingly tortuous: so that whilst the average daily way, according to Villarino's reckoning, made by the boats was seldom more than 2 leagues direct, they often really went by the windings of the river as much as five, or six, or more.

These windings of the river of course very much interfered with the sailing of the boats, and it became continually necessary to be warping or towing them along against the current:—in this the horses were of the greatest use.

The general appearance of the country is described to be an arid, sandy level, very bare of vegetation, excepting some insulated patches along the shore, which being from time to time subject to be flooded, are covered with good pasturage.

The banks of the river, as well as the numerous islands which stud it in many parts, are covered with low willows; from which it is sometimes called the 'Rio Sauces.' Its Indian name is Cusu-Leubú, signifying Rio Negro, or the Black River.

On the *27th of October,* just a month from their leaving Carmen, they fell in with the first Indians, and a day or two after were visited by some of them, with an old interpretess, named Tereza, through whom they got some information.

They spoke of the great Pass of the river at the Choleechel, higher up, where they told them they must cross their horses over to the north side, for they could no longer get along the south bank. This Villarino had already wished to do for some days previously, but had not been able to find any place where he could attempt it with safety. Their Cacique, Francisco, was gone to

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meet some of the Aucazes from the river Colorado, who were passing by the Cholecchel, on their way to their own country, with a great quantity of cattle.

This Francisco had already notice of their approach, and Villarino received a hint from a friendly Indian to be on his guard, for that he was only gone to send his women and children over to the Colorado preparatory to attacking the Peons and carrying off their horses and cattle.

Villarino, however, did what he could to make the most favourable impression upon these people, and made them presents of biscuit, and spirits, and tobacco, all which were articles of great demand amongst them, and greedily asked for.

On the *2nd of November* they reached the beginning of the Great Island of Choleechel, which forms so conspicuous a feature in the map of the river: here the latitude by observation was 39° S.

On the *3rd*, about mid-day, the Cacique Francisco himself appeared, with from thirty to forty Indians; Villarino stopped for them, and gave them all tobacco, and spirits, and biscuit. He was desirous to establish a good understanding with this chief, in the hope of obtaining the aid of his people to keep up his communication with Carmen; but after a day or two not only the Cacique, but the whole party became exceedingly troublesome, continually asking for something to eat or to drink; they would ride also with the Peons, which made it necessary to keep them constantly in view, and to keep a strict watch against any treachery:—so they went on for two or three days till Villarino became quite tired with their importunities and insolence, and on Francisco sending to ask for a cow to divide amongst his people it was flatly refused him. The savage rode off in extreme ill humour; and the next day the rest of the Indians followed him. Tereza, the interpretess, however, managed to inform Villarino that his ill humour on this account was not the main reason for his sudden departure, but that he had two men with him who had deserted from the boats, who he was fearful might be discovered.

This was on the *6th;* and soon after they came to a sort of peninsula, over against the Cholecchel, which Villarino was struck with as an admirable position, affording an abundance of good pasturage for cattle, and easily defensible from its being connected with the main by a very narrow neck of land, not more than 250 yards across.

As they advanced, they found the Indians had everywhere destroyed the pasturage, so that it was difficult to obtain sufficient for the horses and cattle along the banks of the river: there were also other indications of their hostile disposition; fires were nightly seen in the distance, which were known to be the signal amongst

them for a gathering against their enemies. Some stray Indians who fell in with the Peons, told them that the Cacique Guisel was behind them; others were seen to pass by, some up and some down the river without coming near them as usual, and Villarino became exceedingly uneasy lest they should cut off his communications with Carmen.

On the 9*th*, he determined to send to Francisco's tents, to endeavour to gain intelligence as to what they were about; and one of the sailors, a Paraguay man, named Benites, having volunteered the service, Villarino despatched him with a present of spirits, and a request to Fransisco that he would send him one of his people to take a letter down to the settlement for the superintendent, to whom he was writing for more cattle, some of which he promised to give him when they arrived, if he would undertake to forward the letter. This man, Benites, unfortunately, was not trustworthy; he was absent the whole day, and though he had been with the Indians the greater part of it, he brought back but little information; Villarino suspecting him, desired he should be carefully watched; but the precaution was in vain, for he ran away in the night. It turned out that he had taken a fancy for a daughter of Francisco's, and had for some time intended to desert: but what was worse, he, as well as the other deserters, had taken the pains to excite alarm amongst the Indians, and to persuade them that the Spaniards intended to attack and destroy them; which, in some measure, accounted for their suspicious proceedings.

On reconnoitring the ground in the neighbourhood the morning after Benites escaped, they found tracks of armed Indians who had been watching them during the night, apparently with some hostile intention. Putting all these circumstances together, and foreseeing that he could not calculate upon the least assistance from these people, on the contrary, that he must, in all probability, depend entirely upon his own resources, Villarino determined to advance no farther till he could communicate with Carmen, and receive from thence such aid as would make him independent, and enable him satisfactorily to continue his voyage: he therefore determined to go down the river again to the position over against the Choleechel which he had noticed on the 6th, and there wait for further instructions.

He came to this resolution on the 10*th:* and at eight o'clock on the morning of the 11th, the boats commenced their return down the stream; a guard of 16 men having been sent on shore to drive the cattle back to the place above-mentioned, where they all, the boats as well as the party by land, arrived about 6 o'clock in the evening. Here a guard was set, the boats' swivels were loaded, and every precaution taken against a surprise.

12*th.* On a further examination of the place, Villarino was highly satisfied with it as a position where he might pass some time in case of necessity. It was found to contain excellent pasturage for a considerable number of cattle, fire wood, and plenty of game; the river in the vicinity abounded in fish, especially trout; and the peninsula being only accessible to the Indians by a very narrow neck of land, it was easy to fortify it against all their attacks; the great island of Cholcechel opposite to it made it still more difficult of approach. The island in question, he says, is 9 leagues in length and in some places 3 in width.

On the 13*th* the people were set to work to cut posts for a palisado across the isthmus, and for an inclosure for the cattle; but before night a dragoon with two Peons arrived with letters from the superintendent, promising to forward some supplies in the course of 10 or 12 days; and the expectation of speedily receiving this assistance seems to have made Villarino doubt as to there being any necessity for making the stay he at first contemplated in this place. On the morning of the 15th the dragoon was sent back with letters to the establishment.

On the 18*th* the river fell about 5 inches, just enough to prevent the swivels of the boats from protecting their position, which made it necessary to land and mount them on shore. The men were employed daily till the 26th of the month in mounting the guns and working at the fortification; by which time the whole was finished; it consisted of 1670 strong posts driven upright into the ground, making a tolerably compact palisado across the narrowest part of the isthmus, having only one opening in it for the entrance; it was named Fort Villarino, and it formed quite a sufficient protection against any surprise on the part of the Indians. Its position will be found marked in the map opposite to the Cholcechel.

Day after day reconnoitring parties were sent out, but, except finding the tracks of Indians who might have been watching them, nothing occurred worth notice till the 5th of December, when it was observed that the waters were falling fast. This made Villarino exceedingly anxious for the arrival of the supplies promised to be sent from the establishment. The fires of the Indians were continually seen, and it was evident they were on the watch, though they kept out of sight. On the 8th, Nicolas Baltazar, one of the sailors, who had gone out to shoot birds, disappeared, and on sending a party in quest of him, the tracks of several Indians on horseback were discovered, who it was supposed had carried him off. On the 10*th of December* he observes, 'We have now been a month in this place waiting for the supplies promised us from Carmen; the delay has been highly injurious to the objects of the expedition, and if we are kept here much longer

may make it altogether impossible to realise them; first, on account of the continual falling of the waters, and next because it may give the Indians time to lay plans to attack us and to carry off our horses and cattle, once deprived of which we can do nothing.' On the evening of the 12th, however, these long expected succours arrived in carts under the escort of a party of soldiers, foot and horse, in all, with the Peons, consisting of 46 people.

Fortified with this reinforcement, Villarino was at first inclined to proceed at once to find the Indians, and either to secure their co-operation by conciliation, or if they refused to give up the deserters and to listen to fair words, to frighten them so as, at any rate, to induce them to keep at a distance, and out of the way of giving further annoyance to the expedition as it continued its course up the river. In this, however, he was shaken by the instructions he received from the superintendent, who warned him particularly against taking any step which might endanger the safety of the people or horses: indeed, so doubtful did the superintendent consider the possibility of his being able to protect the horses as he went farther up the river, that rather than run the risk of any dispute with the Indians on their account, he desired they should all be sent back to the establishment. Villarino thought it his duty to attend to these orders, although, he says, the horses were the main stay of the expedition.

The people were fully occupied till the 20th December in repairing the boats, and loading them with the provisions sent them for their voyage from Carmen: all the cattle were killed (twenty-two animals), and the meat dried and salted and divided amongst the boats. Villarino complains of the bad quality of the biscuit, and of the scantiness of some of the other supplies which had been sent him.

On the 17*th* the carts with all the horses returned to Carmen; and on the

20*th*, The boats once more got under weigh.

On the 22*nd* they passed the place which they supposed to be that called by Falkner Tehuelmalal.

On the 25*th* they found the river so full of islands, that it was difficult to choose which passage to take: the same evening they reached the pass of the river frequented by the Indians, from whence it was found impossible to get farther along the southern bank, which agrees with their accounts. Such was the force of the current, that, although the wind was fair, they could make no way against it either sailing or rowing, and the men were obliged to tow the boats along often up to their waists in the river. Villarino bitterly complains of the superintendent having ordered back the horses, the want of which he now grievously experienced. Had he had them, he says, he might with their aid in

towing the boats have made every day at least six leagues distance, instead of being so little advanced as they were on their way.

Hereabouts the waters were noticed to be of a deep red hue, which Villarino supposed to be caused by some red soil occurring above, for they had not observed any thing of the sort lower down.

On the *29th*, at mid-day, the latitude was found to be 38° 52′ S. Shortly after they came to a place where the Indians had crossed the river from the north to the south side with cattle and horses; by the tracks they appeared to have come from the Colorado.

The pass is easy of access from both banks, and the river is more narrow than below.

On the 31*st* about mid-day a cloud of dust was seen on the north shore, and soon after a number of Indians with their horses came in view; at first they were rather shy, but having received some presents of spirits, tobacco, &c., they became less reserved and remained gossiping till night.

The boatmen begged permission to traffic with them for some fresh provisions, which Villarino permitting, the people of the San Juan and San Francisco bought of them two heifers for a couple of knives, and those of the Champan got a fat cow for a flask of spirits, a cap, and a knife: he was in hopes they would lend him some horses to assist his men in towing the boats, for they were much weakened by the exertions they had been obliged to make since leaving Fort Villarino, and some of the strongest of them were ill from over fatigue.

1*st January*, 1783.—These Indians had with them a youth about sixteen years of age, who spoke Spanish better than any Indian they had yet met with; from whom they were able to get a good deal of information. It appeared that the party were Aucazes, or Araucanians, from Huechum-Huechum, called by Falkner the Lake of the Boundary, from which they said it was only four days' journey to Valdivia, though the road to it was difficult on account of the Cordillera.

They were on their return from the Sierra del Vulcan, for which they had left their own country nearly a year before in quest of cattle, and horses, and sheep, in which they traffic with the people of Valdivia, who give them in exchange hats, and bridles, and spurs, and a sort of indigo, with which they colour their cloaks (nothing less, observes Villarino, than an encouragement held out by the Spaniards of Valdivia to these people to go and steal cattle for them from their countrymen at Buenos Ayres). They said they mostly lived in tents (*toldos*), and that they sowed wheat, and barley, and beans; but some of them had straw huts convenient

enough built along the side of the hills of the Cordillera, who, besides their wheat and barley, grew lentils, and pease, and onions, and many other vegetables: they fetched their salt, they said, from the Colorado in skins, having none in their own country. None of them had ever been at the Spanish settlement on the Rio Negro, their usual journey being across by the Choleechel Pass to the Colorado, which is more than 70 leagues to the westward of it. On the north side of the river they said there were no resident Indians till arriving at the Apple Country, and that those occasionally seen there were only on their journeys, and that all those Indians who are met with in the Sierra del Vulcan and the Pampas of Buenos Ayres only go down for the purpose of collecting cattle; that on the south side live the Huilleches (southern people), who lay wait for the people of Huechum on their return with their cattle, to rob them. They were very particular in their inquiries whether Villarino's people had seen any of these Indians on the south side of the river.

They spoke of the river Limé Leubú, and of its inhabitants the Limeches, and called many places by the same names as Falkner. They agreed generally with his account, except that they called the distance from Huechum to Valdivia only four days, whereas he says it is six. He also supposes there may be a communication between the lake of Huechum and the river Valdivia, which these Indians denied; though they said that that river, which is a considerable one, is near the lake, not more than a day's journey off; as to the little river of the north (the Pichileubu of Falkner) which falls into the river Negro, they knew it descended from the Cordillera, but whether or not it passed near Mendoza they could not say, because they were not acquainted with those parts; but they said their Cacique had been along its banks and could give more information about it, in consequence of which, and at the suggestion of the young Indian, who proved a very intelligent interpreter, Villarino sent one of his people, a native of Mendoza, to his encampment, to request him to come down and pay him a visit. He wanted the young Indian to hire himself to go with him as far as Huechum, and thence show him the way over the Cordillera to Valdivia, where it appeared he had passed some years with a Spaniard, which accounted for his understanding the language so well; but the youth's father objected, saying he wanted his assistance to help him to take care of the cattle he had with him.

On the morning of the 2nd, the messenger returned with the Cacique Guchumpilqui, who he reported to have with him at his encampment more than 100 Indians, and a large quantity of cattle and sheep. He brought with him five other Caciques,

who were shortly followed by a great many of their companions, with their women and children, so at last there were from 80 to 100 of them. Villarino had enough to do to satisfy this large party, and seems to have lost all patience with their insatiable importunities for presents. He got but little more information from them; but Guchumpilqui promised when the boats reached Huechum, that some of his Indians should cross the Cordillera with them to Valdivia.

He gave them a heifer, which was but a poor equivalent for the spirits he and his people had drunk. Villarino also bought of him a couple of horses to give his people some relief in towing the boats.

These Indians were full of protestations of friendship and kindness, boasting all the time of their power, but always ending in begging for something or other; at last one of their Caciques going so far as to assert that all the lands from where they were, to the Choleechel were his, and intimating that he expected the Spaniards would give him something for passing through them. Villarino replied that he was delighted to make the friendship of so powerful a Cacique, and to know he was in his territories, as he professed so much kindness to him; but that the practice of the Spaniards, when the Indians came to see them, was to make them presents, and give them plenty to eat and drink; and now they were returning the visit it was but natural they should expect similar hospitality from their soi-disant friends. The cacique laughed heartily at the answer, repeating it to his companions; and promised to give the Spaniards a cow when they wanted any thing to eat: but Villarino adds, the cow never came.

On the *4th* one of the Caciques, pretending to be unwell, begged to be permitted to go on in the boats with the young Indian interpreter, already mentioned, whose name was José, who his father allowed to go, on condition that one of the sailors should go on shore to help him in his place to attend to the cattle. They were now arrived at a range of hills of a whitish sand, stony, and covered with thorny bushes, which obliged the Indians to leave the banks of the river and to follow a circuitous route some way inland.

On the *5th* one of the launches got aground and was with great difficulty got off; the towing rope broke soon after, and they had hard work to secure her again, such was the violence of the stream. The banks here were found to consist of a sort of mixture of pebbles and white sand, very crumbling, and giving way under the feet, in some places covered with little low thorny shrubs; and the country put on, as Villarino terms it, "a most infernal and desolate aspect."

From the *5th* to the *11th* such was the force of the current and the wind against them that they barely made 6 leagues.

The river here is described as running through a steep, rocky pass, with such a stream that forty men could hardly drag the boats, one by one, through it; the north side of the river was steeper than at any place they had yet passed, and the bed of the river was strewed with masses of rock from it.

On the *11th* they were joined again by the Cacique Guchumpilqui and the Indians; with them also came up their own horses, with the sailor in charge of them, who had been unable to keep along the river side with the boats on account of the intervening range of hills above mentioned; the Indians however had taken good care of him, for which Villarino did not fail to make a handsome return.

The sick Cacique disembarked and joined his companions again; some of whom came on board and made many inquiries as to the objects of the expedition, to which Villarino replied that he was going to Valdivia to see the governor, and to arrange some matters with him; that his stay there would be short, and then he should return down the river again.

Guchumpilqui said, that in three or four days he should send forward notice to his country that he was on his return, that his people there might send him fresh horses, as those he had with him were becoming very weak from the long distance they had come. He added, that it would take his messenger to reach Huechum-Huechum six days; and three more to go on thence to Valdivia, and that this was the time of year when the Spaniards came over amongst them from that place to buy their ponchos. As this seemed to offer just the means he wanted to communicate with the governor of Valdivia, Villarino determined to write by Guchumpilqui's messenger a letter to be delivered to any Spaniard who might be found amongst the Indians at Huechum, earnestly begging he might be furnished with such succours in the way of provisions as would enable him to complete the discoveries he was engaged upon, and carry on as far as possible the objects of the expedition. Some further information was got from these Indians respecting the country higher up the river; they said, that farther up the Rio Negro inclines very much to the south, making a great bend, on which account, on their journey to Huechum, they were in the habit of leaving its course, to proceed across the intervening country, which they described to be full of good pasturage, and well watered by the streams which descend from the Cordillera.

It caused no small surprise in Villarino to be questioned by these people respecting the war between the Spaniards and the English, and if it was still going on;—they said they had heard

about it from the people of Valdivia, who told them that every thing was excessively dear in that place in consequence of it, inasmuch as the English prevented the ships from Spain arriving there as usual. On the 12*th*, after presenting the Spaniards with a couple of cows, they took leave, saying however they should meet again: this party altogether consisted of about 300, of whom only six were women. The cattle and horses they had with them could not be estimated at less than 800; all of which (notwithstanding they continually asserted that they only caught the wild animals in the Pampas) bore the marks of their owners in Buenos Ayres—some proof of the consequences of the marauding excursions of these people within the Spanish territories.

They were hardly gone when one of the sailors named José Navarro was missed, with one of the horses; another of the people, José Mariano, volunteered to go in quest of his companion, but neither one nor the other returning after some time, filled Villarino with suspicions that the Indians had carried them off, and notwithstanding all his kindness and civilities to them had signalized their departure by playing him this trick. On ascending a neighbouring height, which overlooked the country where they had been encamped, he was confirmed in his belief by seeing nothing but a cloud of dust at some distance, which marked the flight of the whole party—evidence, he observes, if any were wanting, of the little faith to be placed in the professions of a people who pride themselves in circumventing and deceiving their best friends as well as their enemies. He was excessively vexed at this, for he feared that there was an end of his friendly intercourse with the very Indians who, from their residence at Huechum, were of all others the most likely to have it in their power to render him efficient aid in the communication he was so anxious to open with the governor of Valdivia.

On the 16*th* the Champan was found very leaky, indeed she had been so ever since leaving Fort Villarino; and it was found necessary to transfer part of her provisions to one of the other vessels, when it was discovered that much of the biscuit was unserviceable; this made a general examination of it requisite, the result of which was that from eight to ten hundred weight were found rotten and thrown overboard.

In the evening a most fearful storm of thunder and lightning and hail came on, such as Villarino says he had never witnessed before in any part of Patagonia; the boats however were covered in in time and suffered no injury; its extreme violence lasted about a couple of hours.

On the 20*th* the southern shore of the river is described as putting on a new appearance. High white ridges run parallel to it at the distance of about half a league, whilst the banks of

the river are of a loose, red sand, mixed with small pebbles, steep and inaccessible, and destitute of all vegetation; the distant ridges occasionally break out into the most fantastic forms, so that some of them might be mistaken for castellated buildings and fortifications. Villarino says, in all his life before he never was in such a frightful, desolate looking place, or one so entirely destitute of all symptoms not only of vegetable, but animal life—not even a bird was to be seen; fragments of rocks constantly falling down impeded the navigation and render it more dangerous and difficult every day.

On the 23*rd*, the horses which they had bought of the Indians, and which had been of the greatest use in towing the boats, were found to be completely exhausted, and it was necessary to leave them behind. At night the boats reached the confluence of the Diamante River.

It had taken them just a month to arrive at the mouth of this river, from their quitting Fort Villarino, in which time, according to Villarino's daily computation, they had made 52 leagues: from Carmen to Fort Villarino the distance by the same computation was 71 leagues, so that in all they had now made 123 leagues (according to their daily reckoning) from Carmen.

It was one of the main objects of the voyage to ascertain the real course of this river, and whether or not it was likely to afford a navigable communication with Mendoza or the adjoining provinces: many streams descending from the eastern side of the Cordillera, between the latitudes of 32° and 36°, were known to take a southerly course, and there seemed every reason to suppose that this would be found to be the principal drain of those waters, and would turn out in consequence to be a very important river: for a long distance before they reached its mouth, the two rivers, though running in the same channel, might be distinguished from each other by their different colours, the Negro as pure as crystal, whilst the Diamante was muddy and disagreeable to the taste; leaving the launches moored at an island at the confluence of the two rivers, Villarino proceeded in the first instance to reconnoitre the latter in a small boat which he had with him; he ascended it about a league, and found it so far a fine navigable stream, but about that distance from its mouth two islands separated its waters into narrow channels in which there did not appear depth enough for the larger boats to pass: it is here that the Indians cross it, and Villarino found evidences of his late visiters having gone over with their horses and cattle 3 or 4 days before. He says, the river so far is nearly as large as the Rio Negro, and much larger than the Colorado, and its periodical floods must be formidable and much greater than those of the Rio Negro, to judge by the vestiges they have left of their

violence: it is much intersected by small islands overgrown with stunted willows: the lowlands along the shore have a most sterile appearance; these are again bounded by a steep range of red cliffs, extending as far as could be seen from a neighbouring eminence, and preventing, as Villarino believed, any likelihood of the river being passable by the Indians in that direction for some distance higher up. The country beyond appeared totally destitute of herbage; not a tree was to be seen at a distance from the river's side, or the least shelter of any kind for man or beast. Towards evening a terrific thunderstorm broke over them from the S.W.; the heavens became as overcast as though it were going to rain for a week, and Villarino hurried down the river again to join the boats. He does not appear to have made any further attempt to explore it. In one place, he says, the hope of reaching the Cordillera before the snow should prevent his crossing over to Valdivia induced him to abandon his first intention of passing seven or eight days in a further examination of it in the little boat: in another place he expresses his regret that he did not reach it during the time of the floods, which might have enabled him to ascend it with the launches; and he states his belief that in 25 days he should have found himself in the neighbourhood of San Luis or Mendoza.

On the *25th* they proceeded on their course, and about a league above the confluence of the rivers observed the latitude in 38° 44′ S.

Above the Diamante the country, as far as the eye could reach from some heights which a party ascended, presented one uniform desolate aspect, a vast extent of loose sandy soil mixed with gravel, destitute of all herbage. The only exception observed was upon the point formed by the confluence of the Diamante and Negro, where there was a better soil and pasture-ground sufficient for the subsistence of a permanent settlement, a position which, Villarino says, for many reasons, would be an admirable one for a permanent military post.

At the end of another week they had made little more than ten leagues beyond the mouth of the Diamante, such was the force of the stream against them. The river now began sensibly to alter its course and to run in a S.S.W. direction, between high precipitous banks.

The *1st* and *2nd February* were spent in cutting with spades and pickaxes a passage for the large boats through a part of the river where there was not above a foot and a half water; not but there was depth enough in the main stream, but, Villarino says, in that part the current ran like a sluice, and nothing but a capstern could have got the boats up against it.

On the *3rd* they came to a pass formed by high perpendicular

rocks which, advancing on either side, seemed almost to close the passage. The river here was not more than 500 yards across; a little farther on they came upon some good pasture grounds, where they found tracks of the Indians again; but in general it was observed, after passing the Diamante, that the banks of the river became daily, as they advanced, more steep and inaccessible.

On the *6th* the appearance of the cliffs on either side was very remarkable: in one place they looked like ruined castles, in another two were noticed together exactly like a couple of brick-kilns; just past these a precipitous headland ran into the river about 600 feet high, close to which and apparently just separated from it and standing out in the river, rose a high pyramidical rock, visible two leagues off and looking at that distance like a monstrous giant upon his knees. These rocks once passed, the country became more level, and the river ran through a wider channel.

On the evening of the *7th* they caught sight of some mountains in the distance, which they supposed to be the snowy tops of the Cordillera.

On the *8th* they passed the mouth of a river on the north shore, which Villarino afterwards suspecting to be either the Pichi-Epicuntu, (the little river of the north,) said by Falkner to fall into the Negro, four or five days' march from the Diamante, or the river leading to Huechum, he sent back a party to reconnoitre its course, under the command of one of the masters of the launches. They were absent the greater part of the day, and on their return reported that it apparently descended from the Cordillera; that it might run about a mile an hour, and was three or four feet deep, with gravelly bottom; they brought with them a bottle of the water, which though thick was very good, but excessively cold; they also brought some boughs of apple-trees which appeared to have been stript of their fruit by the Indians. Impressed by their account that this was the river which would lead him to Huechum, the shortest way to Valdivia, Villarino determined to endeavour to pass up it, rather than follow the river Negro, which seemed to be daily trending more to the south. On the *12th* he ascended it about two miles; but it was found impossible to get the launches farther up, in consequence of the shallowing of the water and a rapid, which they could not with all their efforts surmount. He, however, went on shore and followed on foot its course about three leagues, which satisfied him that although it was then impossible for the boats to go higher up, had he been there during the floods there would have been plenty of water, even if the launches had, as he says, a cargo of 1000 quintals on board. He observed two peaks of the Cordillera to the W.S.W., the tops of which were covered with snow; one of them, at the distance of

about 10 leagues, had the appearance A, the other B, (described on the map), was further off and much higher, seeming to rise above all the rest of the Cordillera, which inclined him to believe it was the Cerro Imperial, seen from Valdivia: its snowy top had a strikingly beautiful appearance. The river Pichi Epicuntú seemed to come from it. At the confluence of this river with the Negro the latitude was found to be 39° 35′ S.

One of the launches, the Champan, had become so leaky that she was no longer fit for going on with the service, and it was now determined to send her back to Carmen.

The 15*th*, 16*th*, 17*th*, and 18*th*, were occupied in distributing her provisions amongst the other boats, and preparing her to go down the river again, and partly in a reconnoissance on shore by an armed party of eleven men sent to examine particularly whether there was not some other water communication by which they might reach the Lake of the Boundary, or Huechum. The only result of their observations was, that where they were then moored was a very large island, which extended up the river about 8 leagues further. The Champan was dispatched on the 18th.

As they advanced further the river was found to be intersected with innumerable islands, evidently covered during the periodical floods; and the water became so shallow in many places that there was difficulty in finding a passage for the launches: on the 21st they came to a rapid running over a shallow, which it was necessary to deepen before they could pass: the men were at work the greater part of four days, for it was necessary to unload the boats, and carry their cargoes a considerable distance, as well as to cut a passage for them with spades and pickaxes. They were obliged to work nearly naked in the water all day, and suffered dreadfully from the musquitoes, from which their limbs and bodies became so swollen and disfigured that Villariño says they looked as though they had the plague. They named this place the Paso de los Mosquitos in consequence.

On the 26*th* they found, on the south side of the river, the bed of a stream from the S. E. nearly dry, which Villarino says was not to be wondered at, seeing that *it was nearly five months since there had been a day's rain.* A little beyond the mouth of this stream a spring of water burst out of the cliff, forming a sort of *jet-d'eau* into the river: the cliff, which is here precipitous and well exposed, is described as consisting of about 60 feet of clay (greda), on which rests a bed about 45 feet thick of gravel and sand, the composition of all the country round; and it is from the junction of these two strata that the spring in question bursts out.

The river became now so shallow in many places, that it was only by hard labour and deepening the channel at times with picks and spades that they made any progress, so much so, that

having made barely 9 leagues from the 19th of February to the 4th of March, Villarino began to despair of getting much farther, for, as he says, if they were only to make half a mile a day as they had done sometimes of late, it would take them a couple of months to get 10 leagues. On the 5th, however, the river deepened and became more navigable, which filled him with hopes of getting on faster. Speaking of the appearance of the country, he repeats that in all his life he had never seen any so miserable as that they had passed through since leaving the Diamante. The soil, as far as could be seen of it, was a mixture of gravel and sand, unfit for the growth of herb or tree: they might have supposed themselves on the banks of Avernus, for hardly a bird even was to be seen; for days together a stray pigeon or partridge was all that had come across them; as to any sort of game it had totally disappeared.

On the *8th* they passed a range of cliffs on the south side, of a hard, white stone, fit for building; a reef of which ran across the bed of the river like a wall, and the navigation became dangerous from the numerous boulders from it strewed over the bottom of the river.

On the *9th* two of the sailors were found to have the scurvy; they fortunately, however, fell in with some apple-trees covered with fruit, which proved a most seasonable supply, just as Villarino was lamenting that he had neither a surgeon nor medicine of any sort with him.

On the *13th* the river made an elbow from which it appeared to run more to the south; and here the channel became narrower, running through rocky cliffs on either side—part of the lower range, in fact, of the Cordillera.

On the *14th* with much difficulty Villarino ascended the highest of the hills within sight: not only was it so steep that he was obliged to crawl up it on his knees a great part of the way, but the whole soil was so loose that at every step it gave way under him, large boulders rolling down and endangering those below: no sum, he says, would have induced him to mount such a place again on his own account; and the king's service alone could ever have induced him to run such a risk of his life. However, he was repaid when he reached the summit, from which he clearly made out the whole line of the Cordillera, and was fully satisfied that the mountain he had seen some days before was the Cerro de la Imperial: its peak, he says, stands alone above and beyond the principal range of the Cordillera, completely covered with snow; and from where he was he judged it to be about 15 leagues to the N.W.: the range of the Cordillera he thought was not more than 10 leagues off.

On the *15th* they came to a morass on the north side of

the river, into which a stream discharges itself from the Cordillera, which in the winter season, to judge by the appearance of its banks, must bring down a considerable body of water. Beaten tracks of the Indians were here observed leaving the river-side, and apparently cutting across in the direction of Huechum, or the Lake of the Boundary: from that direction the course of the river seemed every day more to diverge: according to the observations Villarino had taken the day before, he had satisfied himself that the Cerro Imperial was only 15 leagues off, and that he was already much to the south of the latitude of Valdivia.

Hereabouts they first saw some guanacoes, and it was wonderful to observe how those animals ran up and down the most craggy and apparently inaccessible places.

The channel of the river now became one deep, continuous pass or ravine, cutting through the rocks. On the 17*th* a piece of wood was picked up in the stream belonging to no tree known to grow between where they were and the mouth of the Negro: they believed it to be of a species of which there is a great abundance over against Chiloe, where it is used for ship-building, and exported to Lima in large quantities.

On the 19*th* the latitude was found to be 40° 2′ S.

If they now made a league in the course of the day, it was thought good work; but Villarino says he can hardly describe the labour of the people in hauling the boats up the stream, or the difficulties of the navigation, which seemed at every wind of the river to increase.

On the 25*th*, having made, according to their daily reckoning, 41 leagues from the Diamante, and being within 5 or 6 leagues of the foot of the Cordillera, they arrived at an island where the river seemed to divide into two; one branch coming from the south, the other from the north. Here Villarino determined to give the men a day's rest, whilst he started himself in his little boat, to explore this new fork of the river: accordingly, the next morning early, accompanied by one of the carpenters, he rowed up that branch which came from the south, called Limé Leubú (the River of Leeches) by the Indians, (marked in the map, the Rio de la Encarnacion.) They had not gone far when they came to the vestiges of an Indian encampment, where they found two stuffed horses stuck upright in the ground with stakes, as is usual where these people bury one of their Caciques, or persons of consequence. As they advanced, they met with huge piles of timber washed down by the stream: many of these trees were entirely new to them, but appeared fit for all useful purposes, some of them being very hard and close-grained, and others lighter and sweet-smelling: large quantities were seen heaped along the banks, for the most part however much spoilt by long

exposure to the action of the water and to the sun: some of them measured a foot and a half in diameter. The river itself, Villarino says, at its mouth, is about 600 feet across, with about five feet depth, where they examined it; this, however, no doubt, at any other season, would have been much more. Its course is from the S.W., running with much rapidity through a deeply-cut channel, full of large round smooth stones: the water is very clear and sweet, but the banks on either side have a most desolate aspect—nothing but sand and gravel, on which apparently nothing will grow: this was the appearance as far as they went, though they judged from the trees, that higher up the soil must be better, to admit of their growth. Satisfied with this examination of the southern branch, Villarino resolved next day to proceed up the other, which he fully expected would at last take him to the neighbourhood of Valdivia.

The island at the junction of the rivers, or rather which separates them from each other, is about a mile and a half long, and is principally composed of sand and gravel; they found some apple-trees upon it. According to their daily reckoning, they had now made 165 leagues from Carmen; having navigated the whole course of the river Negro to the very foot of the Cordillera.

On the 27*th* they entered the river, called in the map, the Catapuliche; it was hard work to make way against the stream, which became more and more rapid as they advanced; in four days they only accomplished as many leagues, which brought them to a small river running into the Catapuliche from the S.W., which, on examination, was found not to be navigable; it discharges itself into the main river by seven mouths, from which they named it the Rio de las Siete Bocas. The nearest range of the snowy Cordillera was not more than two leagues off. The Cerro Imperial, though generally covered with clouds, was occasionally distinctly visible, covered with snow, and, as they judged, distant from them about 7 leagues. The Indians had told Villarino that he would find a great abundance of apple-trees along the sides of a high mountain looking over the sea, and he was now satisfied they meant this Cerro, for along the banks of the rivers which descend from it, not only to Valdivia, but to Conception, it is well known that there is a great quantity of that fruit. He was now only anxious to reach the Lake of the Boundary, from whence he hoped to be able to communicate with Valdivia. The passage of the river, however, became every hour more difficult; about six leagues from its entrance they reached a place where it separates into three channels divided by islands; on the north side there is a considerable extent of good pasture-ground, evidently much resorted to by the Indians; and on the shore was found a quantity of the pine-fruit, which had been brought down by the current

of the river. The San Antonio was found to make so much water that she was hove down to be examined, and was found in so bad a state that, but that he did not like to lose the assistance of the men now he was so near the Indian territory, Villarino says he would at once have sent her back.

On the *5th* and *6th* they had to pass the launches over a place where there was little more than a foot water; it was necessary to take everything out to lighten them, not only all the provisions, but masts, oars, and everything else; the men were almost worn out with the hard work they had to go through; and after all, in many parts they were obliged to deepen the bed of the river ere the boats could be dragged through.

On the *7th,* about mid-day, a party of Indians showed themselves on the south bank of the river, calling out 'Basilio! Chulilaquin!' Nor was it long before the Cacique Chulilaquin made his appearance. These Indians brought with them some very fine apples as presents, which they at first set a high value upon; but Villarino soon made them aware that he knew well enough they were not so scarce as they pretended; besides which they were for the most part all the worse for having been brought some way on horseback, though some of them were of very large size; so much so, that two of them, which were picked out for their size, weighed not less than seventeen ounces. They also had with them some piñones, or pine fruit, which Villarino describes as exceeding good eating; he says, had he had but enough of them, he and his people could have gone for three or four months without any other food; he describes them as resembling the Barbary date when taken out of the husk or pine apple which covers them.

On the *9th* the weather set in exceedingly bad, with much snow and rain, which made it necessary to cover in the boats. The Indians however did not fail to visit them as usual, and they soon learnt that the Cacique Francisco with his people was hard by, with their deserter Miguel Benites with him. In fact, on the 11th some of the women of that party, and amongst them the interpretess Tereza, ventured to show themselves. On being asked why Francisco had broken his promise of joining them at the Choleechel, whence he had engaged to send one of his people down to the establishment with their letters for the superintendent,—they said Benites had told them that the Spaniards were only watching a good opportunity to attack them, to seize upon their horses and cattle; and that two Indians from the Colorado were expressly sent by the Cacique Negro to put them on their guard against them, so that Fransisco fled, from pure fright for his life. Desirous to undeceive them upon this point, Villarino told them, if Francisco would bring Benites to him he would make him confess what lies he had told, for he could

easily prove that the whole was an invention to facilitate his going off with Francisco's daughter, for whom he had taken such a fancy that he wanted to make her his wife: upon hearing which, all the Indians burst out laughing, ridiculing the notion of a Cacique's daughter marrying a slave, for as such it appeared they now looked on Benites.

These Indians said that the ruins of the old Spanish Mission on the lake of Nahuelhuapi,* opposite to Chiloe, were only two days up the river Encarnacion, and were still to be seen there; but what Villarino could not understand was, they said that not long before some Spaniards had been there with a boat, which being broken to pieces, they returned whence they came; from which they inferred there was a communication with the sea from those parts, which, observes Villarino, is physically impossible: had the Spaniards really been there, as the Indians reported, he adds, they must have put their boat together after crossing the Cordillera, or perhaps have built it on the spot, of the timber of which it is well known there is such an abundance in all the Cordillera opposite Chiloe, fit for such purposes: they added, that in those parts the lands were very fertile, and well wooded; that potatoes of extraordinary size grew there, and a vast quantity of apples, particularly about the place where the chapel of the missionaries was: that that country was called in their language Tucamalil, and that the Indians who lived there had been across to San Julian's, and bought many articles from the Spaniards at that settlement.

On the 11*th* Tereza and another woman of Francisco's party came to tell them that Benites had run away the night before from their encampment with another of their deserters; that they had carried off two horses, and stolen the Cacique's sabre; but that they had been pursued, and Benites, after being wounded, had thrown himself into the river in attempting to escape from his pursuers. It appeared that this man had really done all he could to excite the Indians against his countrymen, telling them that the object of the Spaniards was to take possession of their lands and to establish forts in them; especially at the passage of Choleechel, which had particularly excited their alarm, inasmuch as the existence of many of them in a great measure depends upon their free communication with the Pampas by that pass. This accounted for their evident anxiety to learn the truth as to the objects of the Spaniards in visiting those parts, about which they never lost an opportunity of questioning the sailors.

* This mission was founded in 1704, by some Jesuit Fathers, who were afterwards massacred by the Indians; for an account of it see the "Lettres Edifiantes." The name is derived from Nahuel—tiger and huapi—island.

As they ascended the river the pasturage became more abundant, and the country had a less desolate aspect, although they were not more than 2½ leagues from the main range of the snowy Cordillera, in the W.S.W., and 7 or 8 in a straight line from the Cerro Imperial, or the Yajaunassen, as the Indians call it, which had a splendid appearance covered to its base with snow.

The heavy rain which had fallen increased the depth of water, though still there was not sufficient to allow the launches to make much progress through the numerous shallows, indeed nothing but the extraordinary exertions of the men could have got the launches up; but the expectation of so soon reaching the Lake of Huechum, from whence they might communicate with Valdivia, and obtain assistance to carry on their discoveries as soon as the floods should set in, gave them fresh courage, and Villarino speaks in the highest terms of their indefatigable zeal and excellent conduct throughout all the many difficulties they had to encounter. If the Indians opposed their communicating with Valdivia, they were ready, they said, to volunteer, well armed, to force a passage through their territory, and to run all risks to secure the co-operation of the people of that place in completing the service they were engaged in. Villarino says it was impossible for him to have been more admirably and better served than he was by these men from first to last.

On the 15*th* the latitude was found to be 39° 33′. They continued to receive daily visits from parties of Indians, bringing fruit and also sheep to sell; but as his own stock of marketable articles began to run short, and he was anxious to keep some of his trinkets to reward those who might aid him in communicating with Valdivia, Villarino was obliged to send most of them away; especially those who brought fruit, for which they always asked what appeared a ridiculous value in exchange. They found out, however, at last, that these Indians were themselves obliged to buy them of the Pehuenches,* the owners of the lands in which the piñones grow, as well as the greater part of the apples, for the Pehuenches will not allow them to go there themselves to gather them. The Pehuenches are a people who have fixed habitations, and live higher up the Catapuliche; they sow corn, and maize, and other fruits; and of the apples they have their yearly gathering or harvest, of which they make cider in considerable quantities: and though they traffic with the Huilleches, the Leubuches, and the Chulilaquines, and other Indians who bring them cattle and horses from the Pampas, being a vagabond, thieving, and unsettled race, they will not allow them to go and do as they please

* *Pehuen* signifies a Pine in their language, and from this the people where those trees are found take their name of *Pehuenches*.

amongst them. In examining one of the bags of these people in which some piñones were brought down, Villarino picked out some excellent wheat, maize, beans, lentils, and white and black peas, all which he was told were grown in abundance by them in the plains of Huechum, and higher up the river.

Up to the 17*th* of April they had advanced only 10 leagues up the Catapuliche. On that day they were surprised by the arrival of some of Chulilaquin's people, in great haste and disorder, to tell Villarino that Chulilaquin had had a personal quarrel with the Cacique Guchumpilqui, and had killed him with his dagger in his tent the night before, because he had come to solicit him to join in a plan to attack and destroy the Spaniards; but being greatly alarmed lest the Aucazes should immediately determine on avenging the death of their Cacique, he begged, as he had acted entirely for the sake of the Spaniards, that a party of them well armed might be immediately sent to his assistance, and that he would send horses for them. Villarino suspecting the truth of this story at first, said what he could to excuse himself from sending the men. It was evident, however, that the Indians were in a great state of excitement; and he prepared at night for anything that might happen. The next day a cloud of them was seen galloping down to the boats: the first who arrived were the sons of the Cacique and Tereza, who brought with them two sheep as a present; a great number followed, and in about an hour afterwards Chulilaquin himself appeared dressed out in the uniform and with the bâton of a Cacique given him by the Spaniards. He presented himself with no little ceremony, and made a long speech, which Villarino says, as a specimen of their verbiage, was worth hearing. He began by laying great stress on his extraordinary attachment to the Spaniards: then he dwelt upon the evil designs of the Aucazes, and their plans to cut off the expedition, in furtherance of which Guchumpilqui had had the audacity, he said, to solicit him to join him, trying to make him believe that the Spaniards were come amongst them with hostile designs, and were acting with bad faith; this he said he could not stand, and therefore he killed him: that as the Aucazes had gathered together, and were preparing to attack him, he had fled with his people to place himself under the protection of his true friends, for he was sure they would rather lose their own lives than suffer him and his people to be destroyed.

Villarino told him he might rely on his protection, and consider himself and his people perfectly safe so long as they remained near him. During the conference the Spaniards were all under arms, whilst the Indians were grouped round on horseback very attentive to what was passing. Villarino addressed some words to them to encourage them, and to show them the sort of aid he

was ready to give them he ordered a gun in one of the launches to be fired off. That night they pitched their tents within little more than a musket shot of the boats. The interpretess Tereza, however, remained on board to speak privately to Villarino. When they were alone she said the history of the cause of Guchumpilqui's being assassinated was a fabrication, that the truth was he had gone to Chulilaquin with a quantity of ponchos and some mares to ransom a girl whom the latter had lately taken; and that they had come to an agreement, and all was apparently settled, when one of Chulilaquin's sons took offence that Guchumpilqui had not made him any present upon the occasion, which ended in a scuffle, in which Guchumpilqui and another Indian were killed; but she said it was not the less necessary for the Spaniards to be on their guard, for the Cacique Francisco, who was leagued with Guchumpilqui's people, was not to be trusted—that he had determined not to give up the deserter Benites; and had been very active in exciting the Aucazes to attack the expedition, principally on the ground that the Spaniards designed to establish themselves at the Choleechel, which of all things she said the Indians of those parts were most afraid of their doing.

She said she was quite tired of living amongst them, and begged Villarino to take her on board with a little girl she had; but she said he must give his word to protect her, for Francisco would give up all the deserters to get her back again, to put her to death for betraying him.

19*th*. It rained heavily all night, but they were kept on the alert by the unceasing cries and noise of the Indians in their tents, who were in the greatest alarm. Tereza, the interpretess, came again in the morning, begging for God's sake to be received on board with her child, who she was anxious to make a Christian of; to which Villarino at last agreed, considering that it was not only a charity to do so, but that the woman might be of much use from the information she was able to give them concerning the Indians. The next day, on examining her further, she said the Aucazes were exceedingly hostile to them, and had for some time determined to surprise them if they had an opportunity. Reflecting upon Guchumpilqui's former conduct lower down the river, in carrying off the deserters—the evidences of the preparations which they found had been made for attacking them at that time—the trick of the Cacique who was with him, who came on board pretending to be sick, and other circumstances, Villarino had no difficulty in believing that this Cacique, who he was persuaded even then meditated cutting them off, had again entered into a plot with the Aucazes against them; and that they imagined the shallow parts of the river, where they then were, afforded the best opportunity for attacking them, for in

many places the Indians on horseback might ride up to the very boats: in fact he was now fully satisfied that some treachery was meant, and the night was again passed under arms.

On the 20*th*, as soon as it was morning, he examined carefully the ground about where he was; and having made up his mind as to the course he meant to pursue, he sent to desire Chulilaquin to assemble his people and come to hear what he had to say to them. When they were gathered together, he made them a long speech something in their own style, through the interpreters, the main object of which was to impress upon them a sense of the great power of the Spaniards, and the necessity of their paying implicit obedience to him as the king's officer in all that he desired them to do; that if they showed themselves faithful and loyal subjects of the king, he would enable them in this emergency to defend themselves against the attacks of all their enemies, even if they should be as thick as the grass on the ground. Then he ordered a flag to be unfurled and some guns fired, the Spaniards at the same time joining in a general shout of "Viva el Rey! Viva el Rey!" When he had done, the Cacique, who Villarino says was really a very intelligent fellow, in his turn addressed his people, exhorting them to place their faith in the Spaniards, and to thank the Pepechel (Deity?) that he had sent them such brave friends in their difficulties; all which was responded to by the Indians following the example set them, and crying out lustily, "Viva el Rey!" Finding them ready to do all that he required of them, Villarino set them to work to form a palisado; his men cut down a number of willow-trees, and the ground being marked out, before night, with the assistance of the Indians, who worked incessantly and with great spirit, a sort of fortification was made sufficient to protect them from any sudden surprise from the Aucazes. Then he sent out scouts to watch at a distance of half a league from each other along the road from the place where the Aucazes were known to be, and to bring timely notice of their movements: these arrangements completed, the Indians thought themselves invincible with the aid of the Spaniards: they killed one of their fattest mares and some sheep, and brought a quantity of apples and piñones for the people to make a feast after their work.

The result of all these preparations was soon shown, for in a day or two one of their spies brought word that the Aucazes, finding the Spaniards preparing with Chulilaquin to give them a hot reception, had retreated in order to collect more people; nor was it long before they heard that they and the Pehuenches were quarrelling and fighting with each other in consequence of the refusal of the latter to join in attacking the Christians, and that some blood had been spilt between them in consequence, so that

the Aucazes were getting out of heart, and had gone back. Chulilaquin's people became in proportion extremely joyous, and in the evening a great feast was held amongst them, according to the custom of these savages, to do honour to a grand-daughter of their Cacique. After a few days the Indians being apparently quiet, and the weather set in fine, though the neighbouring mountains were covered with snow, and all the level country below hard with frost, Villarino resolved to go up the river in his little boat, taking horses with him to tow her along. He had not proceeded far when he arrived at the mouth of the river which comes from Huechum, and which discharges itself with exceeding rapidity over a low reef into the Catapuliche. Proceeding about a league farther, he arrived at a place where the latter ceased to be navigable; and he was about to reconnoitre its course by land, when suddenly a party of strange Indians showed themselves, and then galloped off as if to give notice of his approach; some more were presently after seen; so having ascertained that the river was no farther passable, he returned to his boat, and soon reached his people again.

A party sent out on horseback on the 23rd, to explore the country, was absent two days; they returned with a great quantity of apples: they had been as far as 8 or 9 leagues; and reported the river Huechum to be formed by many smaller streams, the banks of which were covered with apple-trees, for the most part stripped of their fruit by the Indians; but from the farthest place they reached, which was the foot of the southern side of the Cerro Imperial, they said there were extensive forests of the same trees, all yellow with the fruit upon them; that the lands, unlike those they had seen lower down the river, were well watered, and covered with a rich vegetation which it was delightful to look upon; and that the lake of Huechum was in the mountains, about two leagues off; they were shown the place where Guchumpilqui was killed, and his blood; and Chulilaquin's son, who was with them, wanted to disinter the body, that he might cut off the head to show it to Villarino, and would have done so had they allowed him. Looking to the westward, they said, from the place where they gathered the apples, there seemed to be no termination to an extensive vale which opened in that direction, although both to the north and south it was bounded by mountains covered with snow, and in their opinion the opening in question was continuous and uninterrupted by any mountains to the very shores of the Pacific.

All the accounts of the Indians agreed that they were now within three or four days' journey only of Valdivia; they said they knew well the distance, that it might be done in three days on any animal, and that an answer might be easily procured in

seven, calculating three to go, one to remain there, and three to return; that the road was short enough, but bad, on account of the passage of the Cordillera, which it was necessary to travel over slowly; that if it was necessary to bring back any supplies from Valdivia, they must be transported on horses or mules, for no carts could cross; that from the Cerro Imperial the sea was distinctly visible, and was not far off; that the Spaniards had on those coasts large ships and forts, with cannon much bigger than those in the launches, and that from time to time some of them were in the habit of coming amongst the Aucazes and Pehuenches to buy ponchos and cattle, and some of Chulilaquin's people said that just about the time of the death of Guchumpilqui one of them had come with some Peons from Valdivia to the encampment of that Cacique, which was five or six leagues off, to buy the cattle which he had brought with him from the Pampas of Buenos Ayres; and they said they were there at the time, and saw the spurs and other things which he gave to Guchumpilqui's people for the cattle; but when they heard of the Cacique's death, they immediately fled, lest his people should fall upon them in consequence.

Day after day Villarino hoped to find some opportunity of communicating with the governor of Valdivia; but such was the alarm which appeared to be excited by Guchumpilqui's death, that no Indian could be found to undertake to carry a letter through the country of the Aucazes: at last a son-in-law of Chulilaquin, who had relations amongst those people, was prevailed upon to make the attempt: and he promised if he was prevented going on himself, to do his best to get a letter sent on by some of the Aucazes themselves, or by any Spaniard who might be amongst those people. He was absent three days; but on the 30th returned, saying he had found it quite impossible to get any one to undertake the mission to Valdivia after what had happened to Guchumpilqui, and the inveterate enmity of his people, and indeed of all the Aucazes, in consequence.

This seems to have decided Villarino, who made up his mind to move from where he was and return down the river; and with this resolve he forthwith acquainted Chulilaquin, whose lamentations in consequence were unceasing. 'How,' he said, 'would the Spaniards abandon him after all that had passed, and leave him and his people to be massacred by the Aucazes, who had sworn to extirpate the whole race of them the moment they were left to themselves?' 'Nothing,' he said, 'should induce him to stay behind, and he was determined to follow the boats and go down the river, and place himself under the protection of the establishment.' And for this he immediately began in earnest to prepare.

On the *1st* of *May* the river rose nearly a foot and a half, which Villarino was anxious to make the most of; the Indians, however, on one pretext and another, succeeded in delaying him day after day; they brought him a prodigious quantity of apples of various sorts, all excellent in quality; amongst the rest, of the species known in Spain by the name of repinaldos reales (golden pippins).

On the night of the *2nd* the river rose as much as three feet.

On the *4th* the launches got underweigh again, Chulilaquin and the Indians raising their tents at the same time to follow them.

On the *5th* they reached the island opposite the mouth of the river Encarnacion, having just done in two days what had taken them twenty-one going upwards—and this with neither sails nor oars, more than were just necessary to keep the boats in the stream. A little before reaching the island they passed by the encampment of Chulilaquin* and the Indians, of whom they took their last farewell, cheering each other as long as they were in sight. The snow which had fallen since they ascended the river had given an entirely new aspect to the country, so that with difficulty they recognised most of the places which they had remarked in going up.

On the *6th*, after collecting specimens of the timber from the river Encarnacion, they proceeded rapidly on their course down the main stream: the river had risen about 2½ feet since they passed up, and the boats went down without any obstruction.

The courses of many streamlets, which were dry as they passed up, now emptied their waters abundantly into the Rio Negro.

On the *7th* they were fairly clear of the lower range of the Cordillera, and arrived at the commencement of the red marl, which discolours the river lower down. Villarino calculated that every hour now he did about what cost him a day's labour against the stream.

On the *8th* the launches all got a-ground in running through the islands in the pass 'De los Mosquitos :' in the course of the day, however, they made about the same distance as they had done going up in sixteen.

On the *9th* they reached an island where they had buried part of their provisions, and took them on board again.

The next day, after passing a small stream which enters the Rio Negro on the south side they reached the Giant's Statue, of which mention is made in the voyage up, and soon after they saw

* Chulilaquin adhered to his determination of following the Spaniards to Carmen, in the neighbourhood of which he long remained, and proved himself one of their most faithful allies; Francisco, on the other hand, became so exceedingly troublesome, that after a time it was found necessary to put an end to his insolence, and he perished with all his tribe in an attack made upon him by the governor of Carmen.

an encampment of Indians with about 100 head of cattle. When the Indians perceived them they immediately fled, and Villarino went on shore and examined their tents:—it was evident that they were travelling from the eastward by what they found in them: the Spaniards however touched nothing, and went back to the boats after satisfying their curiosity.

As they receded from the Cordillera they found the temperature daily more mild, and they noticed that in consequence of the rains which had fallen since they went up the river, the banks had put on a very different appearance, being now in many places covered with good pasture where before they were entirely barren and desolate, especially between the Giant's Statue and the Diamante, the mouth of which they reached on the 12*th*. Villarino says it was his intention to have spent some days in the further exploration of this river, but on entering it he found, contrary to his expectation, that there was even less water in it than when he visited it going upwards, and not enough for the launches to go up it.

The lowness of the waters of the Diamante was found to affect the depth of the Rio Negro, which below its junction was considerably lower than when they passed up; they noticed also that as they became further removed from the sources of these rivers the force of the current daily diminished.

On the 14*th* they passed the place where Guchumpilqui had gone off with the deserters.

On the 17*th* they reached Fort Villarino at the Cholecchel, where they found the stockade and huts and everything else just as they had left them: there were no signs of its having been since visited by the Indians: but they were much struck with the richness of the vegetation which had grown up about the place; in some places the grass stood a yard high, and many seeds of beans and other vegetables which had accidentally been scattered during their former stay there, had sprung up and were already in a productive state. There were many deer about, and an astonishing quantity of partridges: after passing a day on shore they again started on their voyage, and on the 25th May, just three weeks from leaving Huechum, they arrived safely once more at Carmen, after an absence of just eight months.

[Upon the whole, the results of this expedition were important, though not all that might have been expected, especially as no examination was made of the principal affluent from the north, supposed to be the Diamante:—the great point was established, of the possibility of navigating the main stream of the Negro from its mouth, in the Southern Atlantic, to the very foot of the Cordillera of Chile, within fifty miles of Valdivia, upon the shores of the Pacific: much information was obtained respecting the Indians—the places frequented by them, and

the roads or passages by which they were in the habit of making their predatory excursions into the province of Buenos Ayres; and Villarino points out how easily these marauders might be held in check, if not entirely prevented from further annoying the people of Buenos Ayres, by the establishment of a fort at the great pass of the river Negro, near the Choleechel. It is evident that the Indians were extremely apprehensive that the stoppage of this pass would be one of the immediate results of the expedition, and that the difficulties Villarino experienced when he reached the Cordillera in opening a communication with Valdivia were very much to be attributed to their suspicions on this score:* still he seems to have been more than necessarily timid himself: and his neglect to explore, at any rate, the river Encarnacion upon his return is apparently inexcusable.

He had however many unforeseen difficulties to contend with; the heavy Spanish launches, which were fitted out for the service, proved to be but ill-suited for the purpose; and the time of year appears to have been the worst he could have started in; not only was it the period when the waters were at their lowest, but from an extraordinary drought the bed of the river was even more shallow than usual at the driest season.

In a subsequent excursion, not long after his return, into the territory of the Indians, he was cut off, and barbarously murdered by the savages. W. P.]

* After a lapse of more than fifty years, this suggestion has been carried into effect by General Rosas, the present governor of Buenos Ayres; and a military post has been formed (1833) at the Choleechel, which will not only secure the southern parts of the province of Buenos Ayres from the hostile inroads of the Indians, but will in all probability lead to our obtaining, ere long, much new and interesting information respecting a vast tract of country which is totally unknown to us.—W. P.

It will be seen in the following Journal, that the total distance, by the daily courses, will be—

	Leagues.	Miles.
From Carmen to Fort Villarino	71	1
From Villarino to the Diamante	52	0
From the Diamante to the terminating Fork of the Negro .	41	1
Up the Catapuliche, N.N.W.	10	1
	175	0

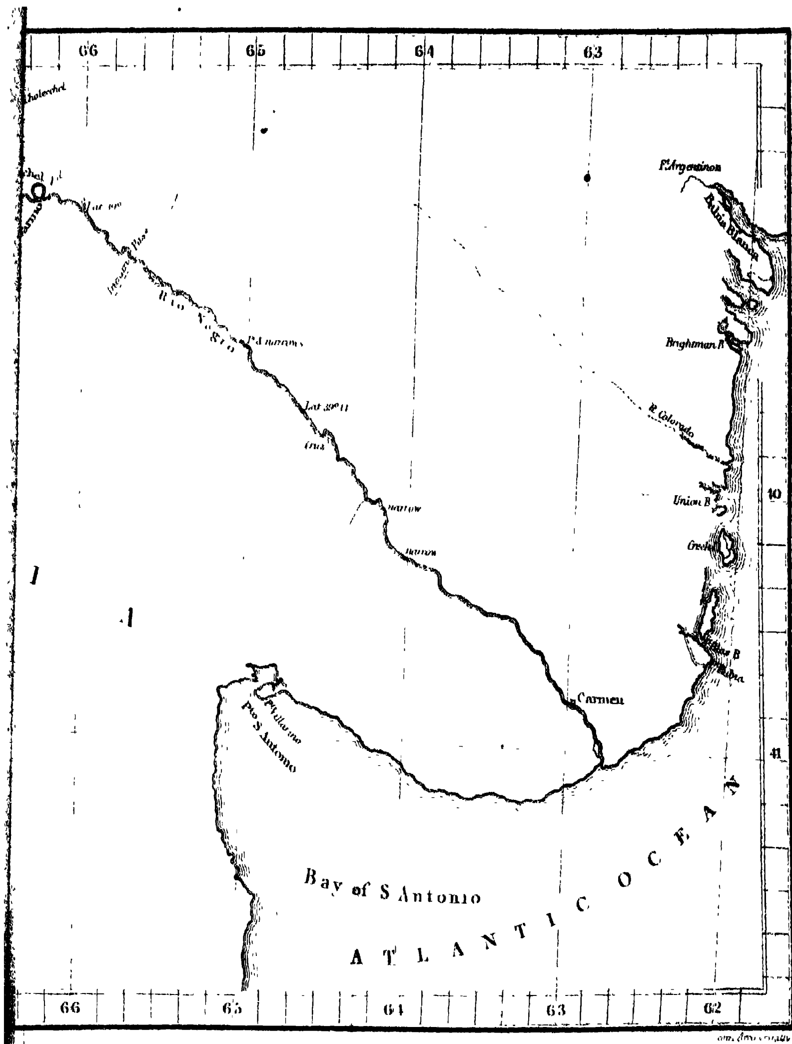
Villarino says, in a note appended to his Journal, that the bottom of the river, as far as Choleechel, is sand; from thence to the Diamante gravelly, with many pebbles; from the Diamante upwards the bottom is strewed with rounded stones and boulders, which increase in size as the range of the Cordillera is approached. The depth varies much, as well as the current, depending, in some measure, on the more or less width of the bed of the river, and is liable to great changes in the time of the floods, which are periodical, and twice in the year, from the rains in the winter, and the melting of the snow in summer.—W. P.

Distances and Courses noted on Villarino's Voyage up the River Negro.

Date.	Distance corrected by daily reckoning.		True Daily Course.	Distance where given by windings of the river.	Remarks.
1782	Lgs.	Mls.		Leagues.	
From Sept. 28 to Oct. 2.	11	..	N.W.¼W.	..	Direct distance from Carmen.
5	5	..	W.N.W.	12	
6	..	2	W.N.W.	3	
7	1	1½	N. by W.	4	
8	2	..	W.N.W.	5	
9	2	..	W.N.W.	..	
10	2	..	N.W.	6	
11	2	1	N. by W.	6	
12	3	1½	N.W.	6½	Indian Road to San Antonio passed.
14	1	..	N.W. by W.	..	
16	5	1	N.W.	11	
17	1	..	N.W.		
18	2	1	Not given.	..	Latitude observed 39° 44′ S.
19	1	2	W. by N.		
20	2	2	Not given.		
22	1	..	N.W.		
23	3	..	N.W.		
24	1	..	N.W. by W.	..	16 islands counted on the 24th
25	1	1	W.N.W.		
26	1	1½	N.W.		
27	5	..	W. by N.		
28	2	..	W.N.W.		
29	1	1½	W.N.W.		
30	2	2	W.N.W.		
31	1	1	Not given.		
Nov. 1	1	2	W.N.W.		
2	1	1½	N. by W.	..	Beginning of the great island of Choleechel; lat. obs. 39°.
3	..	1½	N.W.		
4	..	2	N. by W.		
5	..	2	W.N.W.		
6	2	..	N.W.	..	Peninsula passed, to which the boats returned on the 11th and constructed Fort Villarino.
From Carmen to Fort Villarino—leagues	71	1			

Distances and Courses—Continued.

Date.	Distance corrected by daily reckoning.		True Daily Course.	REMARKS.
1782	Lgs	Mls		
December 20	3	1½	N.W.	From Fort Villarino.
21	2	..	N.W.	
22	1	1½	W.N.W.	
23	2	2	W.N.W.	Passed the end of Choleechel.
24	3	1	N.W.	
25	3	..	W.N.W.	
26	1	1½	W.N.W.	
27	2	1	W.N.W.	
28	1	1	W.N.W.	
29	..	1	Not given.	Latitude observed 38° 52′ S.
30	1	1½	W. by N.	Pass of the Indians across the river.
1783 31	..	2	W.	
Jan. 1, 2, 3	1	1½	W.S.W.	
4	1	..	W. by S.	The Indian road separates from the river side on account of the hills.
5	2	2	W. by S.	
6, 7, 8	1	..	W.S.W.	
9, 10	2	..	W.S.W.	
11	..	1½	W.S.W.	The Indian road joins the river again.
13	1	..	W. by S.	
14	2	..	W.	
15	4	..	W. by N.	
16, 17, 18	4	..	W.N.W.	
20	4	..	W.	
21, 22	3	..	W.N.W.	
23	1	2	W.N.W.	Junction of the Diamante, a league above latitude observed 38° 44′ S.
From Fort Villarino to the Diamante	52 leag.			


66
65
64
63
Rio Negro
Carmen
Bahia Blanca
Brighitman R
R. Colorado
Union B.
Bay of S Antonio
ATLANTIC OCEAN
66
65
64
63
62
40
41

Distances and Courses—continued.

Date.	Distance corrected by daily reckoning.		True Daily Course.	Remarks.
1783	Lgs.	Mls.		
January 25	1	..	W.	From the junction of the Diamante.
27	4	..	W. by S.	
28	..	1	S. by E.	
29, 30	2	1½	W.S.W.	The river trends to the south.
31	1	..	S.S.W.	Variation of the Compass N. 20° E.
February 1, 2, 3	1	..	S.S.W.	
4	..	2	S.W.	
5	1	1½	W.S.W.	
6	3	..	S.W. by S.	
7	2	..	S.W. by W.	
8	2	..	S.W.	Mouth of the Pichi-Picuntú-Leubú, or "Little River of the North." Latitude 39° 35′ S.
9	..	1	S.W.	Small stream from the north side.
19, 20	2	..	S.W. by S.	The river much intersected by islands.
21, 22, 23, 24	1	1½	S.W. by S.	Shallows at the pass of Musquitoes.
25, 26	2	1	S.W. by S.	A small stream from the S.E.
27	1	1	S W. by S.	The river divided into four channels by islands
March 1 to 6	1	1½	W.S.W.	
7, 8	1	1½	S.W. by W.	
9	..	1	W.	
10	..	1	S.W.	
12, 13	1	..	S.W.	
14	..	2	S. by W.	The Cerro-Imperial seen about 15 leagues to the N.W.
15, 16	2	1½	S.S.E.	A small stream from the east.
17	1	..	S.	
18, 19	..	2	S. by E.	Latitude observed 40° 2′ S.
20, 21	1	..	S. by W.	
22	1	..	S.W. by S.	
23, 24	2	1	W.S.W.	
25	1	..	W.	An island where the river Negro separates in a fork, one branch coming from the south—the Encarnacion; the other from the north—the Catapuliche, distance from the range of the Cordillera 5 or 6 leagues.
From the Diamante to the end of the river Negro	41	1		

XII.—*On the Roads and Kloofs in the Cape Colony.* By Major C. C. Michell, Royal Engineers, K.H., Surveyor-General at the Cape of Good Hope. Communicated by Abraham Borraidale, Esq. Read June 27, 1836.

[The importance of the British colony at the Cape of Good Hope, covering an extent of surface nearly equal to the British Isles, and the daily increasing trade with the interior, give great interest to any information tending to facilitate communication between the various parts of the country—and as such, the remarks of Major Michell, being those of a thoroughly practical man, are very valuable. They are contained in a letter addressed by him to George Thompson, Esq., of Heerengracht, dated Rondebosch, Aug. 25, 1834.]

From a road-book, compiled chiefly from my own notes whilst travelling on horseback, and in waggons drawn by horses, I find that the following may be esteemed a fair average rate of travelling here, viz.:—on horseback, six miles per hour; in a horse-waggon, from five to five and a half; and in a waggon drawn by oxen, three. From the circumstance of being able to travel at this rate, a stranger would naturally conclude that pains have been taken to procure this facility over a surface so vast as from 110 to 115,000 square miles; but this is not the case. We are indebted for it to the nature of the soil, which, with the exception of a few sandy spots of inconsiderable extent, presents a good hard bottom, covered with a crust of iron-stone gravel, so that but for the mountain passes, which are tremendous, the communications throughout the colony would be unobstructed.

The advance of civilization in the colony, and the developement of its capabilities, are almost paralysed by the want hitherto experienced, of means to remove or surmount the natural obstacles above alluded to; but this, I trust, will not long be the case, and as our finances improve, this important subject will no doubt meet with due attention.

I have mentioned the extent which our territory probably squares to; I say probably, because no survey having ever been made whereby either the precise shape or extent of the colony could be obtained, that which we see in maps is but a compilation from the notes of travellers.

Is it not then a pity that, occupying so much country, we should be scarcely able to communicate with the greatest part of it for the interchange of commodities, and that a comparatively easy access should be possessed solely by the small strip of land between the western coast and the mountains constituting the Cape and Stellenbosch districts, whilst those of Clan William, Worcester, Beaufort, and Graaf Reynet, to say nothing of Somerset,

are in a manner shut out from us by the difficulties which the mountains present?

No one who knows the colony will regard the subject of the kloofs, or mountain passes, as otherwise than most important; I therefore trust that you will not think that it is for the mere sake of indulging in a favourite topic that I devote a few lines to it. I will not go into details, but consider the principal ranges which run parallel with the western and southern coast, as the great wall or barrier placed there to put our perseverance to the test, and leave us the choice of continuing till the end of time in our present stunted condition, or by the expenditure of a very few thousands to become one of the most valuable possessions of the Crown in every respect.

Place a map before you, Arrowsmith's last published is by far the best, and I will endeavour to give you a clear idea of our difficulties and wants, beginning with the district of Clan William in the north-west, and leading you down to Stellenbosch, and thence, eastward, to Graham's Town. If you were a military man, I should liken these principal ranges to two corps drawn up *en potence*, with opened ranks; the corps facing the west having the Oliphant's River and part of the Breede River between its front and rear ranks, whilst that which faces the southern coast has its front separated from its rear rank by part of the Breede, the Oliphant's, and the Kromme rivers.

The northernmost kloofs in the above-mentioned ranges are the Piquiniers and Cardouw. The former is the outlet for those who inhabit the Oliphant's River Valley, and all the country about Clan William; its situation is directly east of Piquetberg. The Cardouw is on the second line (rear rank) nearly east of the Piquiniers, and must be the first cleared by the people of the Adar mountains, Middle and Onder Roggeveld, unless the former prefer the Karroo Road and Hex River defile, and the latter should choose rather to head the mountains, and take to the sandy road between them and the coast. To convert these two kloofs into excellent mountain-roads would entail but an inconsiderable expense, and the people of Clan William richly deserve consideration, for they are the most punctual tax payers in the colony—arrears being scarcely known among them.

Proceeding southward, the next outlet we come to is the Tulbagh's Kloof, a natural gap formed by the passage which the Klein Berg River has made for itself, from the valley of Tulbagh where it takes its rise. This pass, though rugged, offers no serious obstacle; the ascents and descents are, for this country, scarcely worth noticing, so that the farmers of the beautiful valley of Tulbagh have, comparatively speaking, little to oppose their bringing their produce to the Cape market; although those whose

property lies at the southernmost end of the valley are obliged to travel a distance of thirty miles due north, and perform a complete counter-march on the egress through the Tulbagh Kloof. Opposite the latter (in the rear rank ranges) is the Witzenberg Pass, and its appurtenance, the Schurfteberg; these open into the Cold Bokkeveld, or, 'land of cherries,' and are sometimes used by the middle Rokkeveld, Klein Rokkeveld, and Bidoum farmers, who may chance to prefer them to others equally bad—for to choose is difficult where all are execrable. I reckon the top of Witzenberg to be about 1800 feet above the valley of Tulbagh, and the ascent is nearly *à pic*; nevertheless, an excellent road could be made here, owing to the facilities offered by the material one would have to deal with; but then the Schurfteberg, its inseparable appendage, would still remain to be accomplished, and a serious undertaking it would prove, to make anything of it. Twelve miles farther south, and through the same range, you find the Mostert's Hoek Pass, formed by the Breede River's escape from the Warm Bokkeveld, whence it has its source, a basin surrounded by high mountains, and which, but for the above gap, would become a splendid lake.

The Mostert's Hoek Pass is, for the lover of beautiful scenery, worth travelling any distance to see. Its length from Mr. Piet. Theron's house, where it debouches into the vale of Tulbagh, to its commencement on the Warm Bokkeveld side, is eight English miles. The first mile and a half from the latter point is of a nature so rugged and precipitous that it is necessary to take a waggon to pieces, carry it and its cargo piecemeal through, and then undergo all the trouble of putting together and reloading; notwithstanding 8000*l.* would enable an excellent pass to be made here; and as its distance from the Tulbagh Kloof is little more than twelve miles, there would be no absolute occasion for the improvement of the Eiland's Kloof, or any other in this vicinity, until the colony could perfectly afford it; besides, the above 8000*l.* would not be required all at once, the nature of the work being such that it would take full four years to accomplish. I consider the construction of a proper pass here, and another at Attaquas Kloof, or in such other part of the district of George's Ranges, or its neighbourhood, as should, upon its being surveyed, appear more eligible; as two works, which of themselves would, without the immediate execution of any others, double those branches of the public revenue that are derived from the internal resources of the colony.

At present, the inhabitants of Graaf Reynet, Beaufort, and a part of Worcester, have, of three evils of pretty equal magnitude, to select that one which, in the opinion of each, may seem to him the least. There is no alternative but to come through Schurfte berg, Mostert's Hoek, or the Hex River Pass.

I have already mentioned the two former; the latter is the third door through which the traveller finds access into the valley of Worcester and Tulbagh. The objection to this pass is, its exceeding length, and the great number of times you are obliged to cross and re-cross the Hex River before you are completely disengaged from it, near its junction with the Breede. In winter this line of road is quite impracticable, as the Hex soon swells into a torrent, rapid, broad, and dangerous.

On the same range as, and to the southward of the Tulbagh Kloof, are the Bastiaan's Eilands (immediately opposite Mostert's Hoek) and Du Toit's Kloof. Of these I shall merely confine myself to giving the names, the two former being mere cattle-passes, and the great length of the latter,* and the expense it would entail to make anything of it, induce me to regard it more as a work to be achieved by our posterity than within the probably available means of our own time.

We now come to the angle formed by the junction of the western and southern ranges, near which are situated the beautiful villages of the Paarl and Stellenbosch, and the still more lovely group of farms called Hottentot's Holland, surrounded by an amphitheatre of hills—the east end of which, assuming a southern direction, stretches down to Hanglip, and this completes the great natural barrier between the Cape Peninsula and the district to the eastward of it.

To surmount this great barrier two works have been undertaken, within these few years, to the incalculable advantage of the colony, and to the honour of those under whose auspices and enlarged views they have been allowed and executed. The first of these is the French Hoek Pass, a splendid mountain-road in every respect; the work of that able engineer and gallant soldier, Lieut. Colonel Holloway, of the Royal Engineers, during the government of Lord Charles Henry Somerset. But it is a matter of regret that this fine work was not (owing to its situation) altogether as indispensable as the second, called Sir Lowry's Pass, executed by the orders of that excellent governor, Sir Galbraith Lowry Cole, in 1830,† at a very trifling cost, for so I consider the sum of 3000*l.* compared with the benefits which have accrued to the colony generally from this work; and to the neighbouring districts in particular, where double the quantity of grain is now sown, and double the number of waggons, of course, cross the mountain.

No better proof can be given of the advantages the public have derived from having this facility of communication afforded to

* About ten miles of very difficult rocky road.

† Performed under the immediate superintendence of the author of this paper, the Surveyor-General—a lasting memorial of his skill and perseverance.—Ed.

them, than is exhibited in the fact of the toll levied there producing to government at present the annual sum of 365*l.*, or 12 per cent.; whereas, prior to the opening, 150*l.* was as much as it could realize.

Every one who has read Barrow, Burchell, or other travellers of note, must have been appalled at the very description of the ascent or descent of a waggon by the old Hottentot Holland Kloof; and will feel pleasure in knowing that the same may now be performed at a brisk trot, having become as good a road as any in England.

The French Hoek road leads to Worcester, by the Bosjesveld, or to Genaadendal, by the Donker Hoek; the former is bad part of the way, and the latter is execrably bad the whole of the way; and this is all that the French Hoek can be said to lead to, unless the Hex River Pass were improved by an endless string of bridges at an enormous expense.

The traveller who goes eastward, next comes to the Houw Hoek Pass, which is at a distance of about fifteen miles from Sir Lowry's. This was another stumbling block, without the removal of which the making of Sir Lowry's Pass would have been a very incomplete thing. Its execution was readily sanctioned by the Home Government, and its cost was barely 600*l.* From hence you have an excellent natural road, as far eastward as the village of George, a distance of 300 miles from Cape Town. From George the passage into the Long Kloof (the regular road to Uitenhage) is over the Cradock's Kloof or pass. This is an awful obstacle; an attempt to describe it would perhaps spoil what otherwise the imagination, being left to its own workings, would form a better conception of; it mocks description. You must see the fact to believe that any waggon had ever dared attempt to climb it.

There is, indeed, no absolute necessity for crossing into the Long Kloof at this particular point. The Attaquas Kloof offers much fewer difficulties, and could be made an excellent pass at a very trifling cost; nor would there be a single dissentient voice in selecting it, but for the existence of the village of George, situated immediately at the foot of the Cradock's Kloof, and which it is presumed would die a natural death, if the latter ceased to be the principal thoroughfare.

I think, however, that were the means of road-making in our hands, no such narrow considerations would be allowed to stand in the way of a work which would ensure so great a public benefit.

From the foot of the Cradock's Pass, or from the point where the Attaquas opens into the Long Kloof, you wind your way with comparative ease and comfort through the latter, crossing and

re-crossing the river, by which it is fertilized, until you reach the banks of the Camtoos, where an excellent ferry-boat conveys you over in safety to recommence your journey towards Uitenhage, through a country improving at every step in beauty and interest. From hence to Graham's Town nothing remarkable occurs till you reach Howison's Kloof, which has lately been improved by the inhabitants of Graham's Town, contiguous to which it lies.

There are a few more kloofs farther inland than I have enumerated. The principal of these is Kujman's Kloof, in the district of Swellendam, and the Caledon, in the George district; but my object being to draw attention to the points where improvements are most necessary, and would be attended with great advantages, both immediate and prospective, I do not regard the last mentioned as belonging to my province, but rather to that of the beauties of African scenery.

I will conclude by remarking, that the small sum of 13,000*l.* would in all probability suffice to remove the two principal obstructions to our prosperity, viz. the Attaquas Kloof, which, if improved, would enable the farmers of the Oliphant's River, Congo, and Long Kloof, to transport their grain to Mossel Bay; besides what I have already said about it and the Mostert's Hoek, the great door to all the north-eastern parts of the colony. I am moreover under the impression that there is much land at this moment which has not been applied for by settlers, owing to the natural conclusion that its occupation would only be a source of expense to the possessor so long as the impossibility exists of transporting to market the fruits resulting from its cultivation.

Under the head of obstacles to that indispensable requisite, a free circulation, I must not omit mentioning, that we are entirely destitute of bridges. We have, it is true, a few tolerable ferry-boats (about five or six at the utmost; little enough for so extensive a country); the best of these are at the Berg, Breede, and Camtoos Rivers; but there are many streams, such as the Erste, Palmiet, Bot, and Buffelsjaght, &c., which, although they contain little water in summer, yet in the winter season acquire sufficient magnitude and impetuosity to be impassable for many days together. And it is only those persons who have experienced the miseries of "outspanning" on their banks, drenched to the skin whilst waiting four or five days for the waters to run out, who can fully estimate the advantage and comfort that would be derived from the construction of a few plain bridges on spots judiciously selected.

I think that if the sum I have already mentioned were increased to twenty thousand pounds (to speak in round numbers), we should have no reason to complain of the want of either roads or bridges for the next two centuries, when, our wealth having had time to

increase by the facilities thus afforded, and the population having become more dense, the rest of the passes, if found necessary, would, I have no doubt, be then opened in the same way that such things are done in Europe at present, viz., by joint-stock companies; which method is out of the question in our present condition.

The granting of this sum would, after all, be but as a kind of loan, as "Sir Lowry's Pass" has plainly proved, for it is paying itself rapidly. Maybe, even if it were looked into, besides what the toll has already done towards paying off the capital, we should find that the increase in the sums paid for opyaaf, or tax on grain, wine, and cattle, market dues, &c., of the districts of George, Swellendam, and Caledon, have also contributed largely towards it. Perhaps I have already made this paper far too long—although I could say a great deal more; but the subject is not of sufficiently general interest, although intensely interesting to all those resident in the colony of the Cape of Good Hope.

XIII.—*Notice of a Journey to the Northward and also to the Eastward of Cuzco, and among the Chunchos Indians, in July*, 1835. Communicated by General Miller, of the Peruvian Service. Read June 13, 1836.

Shortly after my arrival at Cuzco, in January, 1835, I conceived the idea of planting a military colony on the banks of some navigable river on the eastern side of the Andes, with a view, first to facilitate the discovery or examination of the vast pampas or plains lying between what may be called the civilized confines of Peru and Brazil, leaving an immense intervening breadth; and, secondly, to endeavour to open a direct communication with Europe by means of the river Marañon or the Amazons. As a preparatory step I determined to examine the valley of Sant' Ana, to the north-west of Cuzco, to see if there were an eligible tract of country in advance of the valley, for the settlement of a hundred married soldiers with their officers and families: with this view I left Cuzco in the middle of April, and travelling to the north-westward passed the town of *Urubamba*, and continued along the banks of the river Quillabamba into the valley of Sant' Ana, where I took up my quarters at the village of Incharate, twenty-five miles beyond the town of Sant' Ana, and about one hundred and twenty miles to the north-west of Cuzco.

The valley of Sant' Ana, extending nearly fifty miles, watered by the river, or rather the mountain torrent of the Quillabamba, is highly picturesque; bounded on each side by lofty mountains green to their summits; their skirts clothed with thick forests,

Colony
of the
CAPE OF GOOD HOPE.

5 10 20 40 60 80
English Miles

24 25 27 28
29
30
31
32
33
34
25 26 27 28

Campbell's dorp
Ky Gariep or Vaal or Yellow R.
Donkin R.
Modder R.
Riet R.
Nu Gariep or Black R.
Phillipolis
Caledon R.
Stockenstroms R.
Zeekoe R.
Plattenbergs Baaken
New Hantam
Zuureberg
Stormberg R.
Grey R.
Winterveld
GRAAFF REYNET
SOMERSET
Sniew Bergen
Campass B.
Graaf Reynet
Cradock
Gt. Fish R.
Tarka R.
Vlek Poort R.
Black Kei R.
Klip plaat R.
White Kei R.
Gt. Kei R.
QUEEN ADELAIDE
Amatembu
Amakosa
Winterberg
Ceded District
Kat R.
Kalumie R.
Somerset
Sunday R.
ALBANY
Grahams Tn.
Fredericksburg
Bathurst
Theopolis
Enon
Zuure B.
UITENHAGE
Uitenhage
Port Elizabeth
Algoa Bay
Kowie
Keiskamma R.
Buffalo R.
Kat Fish R.
Bushmans R.
Camtoos or St. Francis B.

on 1836
John Arrowsmith.

and at their base tall luxuriant pasturage,—through which numberless streams rush down to swell the torrent below,—with occasionally openings of vast quebradas, or ravines, marking the features of the landscape by their dark masses of shadow, and giving an air of magnificence and grandeur to the scene, peculiarly South American.

To a naturalist this valley, situated between the twelfth and thirteenth parallels of south latitude, must be extremely interesting; beasts, birds, insects and plants abound; the tiger*, the bear, the ounce, the wild boar, the chincay, and the gran bestia†, infest the country, and some of them kill much cattle on the various estates. A few tigers occasionally become ferocious and daring enough to attack men; forty-four individuals, including women and children, were destroyed by them, three years since, in the quebrada of *Occabamba*, ten leagues to the eastward.

From Incharate I made an excursion of twenty miles in a north direction to the *Encuentro*, or junction of the river Quillabamba and its tributary the Yanatildi, which also flows from the south-east nearly parallel to the former. The road, or rather track, runs through a thick forest, which for a considerable distance we were obliged to have cut open by men destined for that purpose, and we were twenty-four hours accomplishing twenty-one miles. On our journey we were much annoyed by a tree called the Palo Santo, which contains millions of ants in its trunk, and spreading boughs with large leaves, that sting and cause a painful swelling in the flesh that happens to come in contact with them. A shrub called Baston del Angel‡, covered with horrible thorns, was scarcely less troublesome. There was no want of musquitos, but the insects that treated us the worst were wasps that made a most furious attack upon our faces whilst descending a steep mountain, and to prevent broken necks we threw ourselves from our affrighted mules. Not one of us escaped with less than two or three stings, which by no means rendered agreeable a chase we were obliged afterwards to run in pursuit of our steeds. I passed two days amongst the Indians called Antes; they have good features, excellent teeth, and pleasing countenances, and their appearance is altogether superior and more engaging than that of our civilized Indians of Peru. I saw one exceedingly handsome, and no very ugly person amongst them. They live in tolerably good huts; wear a cotton robe of their own manufacture which reaches to their heels; they suspend ornamental baubles from their noses, ears, necks, and

* The Felis Onza, or common Jaguar.
† The Tapir (Tapirus Americanus), Danta of the Indians.
‡ Probably a species of cactus.

ankles, and daub their hands and faces with streaks of paint. They cultivate Indian corn, camotes*, yucas, and plantains, which, with the fish and game they shoot with the bow and arrow, amply supply their wants. They have a few pigs and fowls, but never partake of their flesh, as it is not agreeable to their palates; in other respects they are like most other uncivilized tribes, idle, dirty, and incurious.

The Antes occupy the banks of the river Urubamba, forty or fifty leagues downwards from the Encuentro; then follow the nations of Tampas, Palatuniques, Chuntaguirus, Conibos, &c., towards the Marañon. The Chuntaguirus, said to be a superior race of Indians, come up the river annually 200 leagues, to the Encuentro, to barter with the people hereabouts; they bring parrots and other birds, monkeys, cotton robes white and painted, wax, balsams, feet of the gran bestia, feather ornaments for the head, and tiger and other skins; which they exchange for hatchets, knives, scissors, needles, buttons, and any sort of glittering bauble. They are warriors, but unoffending, excepting to their declared enemies. The Pucapacures, or Indians of Paucartambo, sometimes attack them at a rapid formed by the confluence of the river Paucartambo, as in number from 200 to 300 they ascend on their yearly excursion. Bows and arrows, and a sort of wooden sword, are their only weapons. To come up to the Encuentro takes them three months, and to return home scarcely fifteen days. Fray Ramon, one of two missionaries stationed at Incharate and Cocabambilla, only a league distant, once went down the river as far as Santa Cruz and Santo Domingo, former missionary stations, situated on the left bank of the Ucayale, about fifty miles south of the point where Lieut. Smyth, R.N., embarked in February, 1835, to descend the Marañon. The Padre speaks highly of the Chuntaguirus and their country, in which he resided a year, and the only Indians he entertained fear of, or had difficulties with, were the Conibos. What a fine field to explore for two or three enterprising half-pay officers of the British army or navy, or some of the amateur travellers sated with their rambles in Europe!

The result of this excursion was, that neither Santana nor the adjacent valleys offered any sufficiently advantageous situation to form a colony, since the river Quillabamba or Agua Caliente, so called from its source in nearly 15° south latitude, has lofty mountains on either side of it, and is not navigable even for boats. Having ascertained this fact, I retraced my steps to Cuzco, and turned my thoughts to exploring the valleys to the eastward.

* *Convolvulus batátas*, commonly called camote in Peru—*Batátas de Malaga* in Spain; in taste resembling a roasted chesnut.—Ed.

With this view I again left Cuzco on the 17th of July, and after a ride of five leagues over a level line of road, reached the estate of Huambotia, where I slept.

On the 18th, a journey of ten leagues over table-lands, interspersed with ravines, brought me to the town, or *Real Asiento*, of *Paucartambo*, as the capital of the province of the same name is called. This town, situated in a deep ravine, and on the banks of a mountain stream, was once of considerable importance, owing to its connexion with the valleys, twenty leagues distant at the easternmost foot of the Andes, which formerly contained three *Curatos*, and upwards of one hundred estates, principally coca-leaf plantations. Of the latter, owing to sickness, hostile inroads of the Indians, &c., only six now remain. Besides other causes of decay, one-third of the houses of the town of Paucartambo have been carried away by its river within these few years, and it now contains only about some hundred inhabitants, mostly of Spanish blood, and distinguished for their superior intellect, good countenances, and urbane bearing, as compared with the rest of the population in the department of Cuzco.

On the 22nd I set out for the *Valles*, and rode over eight leagues of tolerably good road, but with a considerable ascent, to *Las Tres Cruces* (the Three Crosses), the summit of the last, or easternmost ridge of the Cordillera, whence the forest-clothed pampas, stretching interminably to the eye towards Brazils, burst suddenly on the view. Placed on this elevated station, the traveller is able to descry the base as well as the pinnacles of the mighty Andes, which here rise with remarkable abruptness from the immeasurable plains below. I slept in a hut, erected for the accommodation of the wayfarer; but ere the dawn of day I was on foot, to see the sun cast his first rays on the glorious panorama; and as he gradually rose, the beauties of nature were more and more distinctly unveiled,—heaven and earth seemed to smile,—and as I gazed from this spot upon the bright orb of day, I could not help thinking that the adoration of such an object might be excused, if the worship of any created thing were admissible, and that the idolatry of the Incas was more natural, and more rational, than the wretched and debasing superstition which has unhappily arisen from the worship introduced by the conquerors of the unenlightened but once happy Peruvians. Above and around the sun shone bright and clear, but far below an unbroken sea of clouds concealed the woody plains, as well as a wide navigable river, called *La Madre de Dios*, and several tributary streams, the silvery courses of which are plainly discernible when the atmosphere is clear. The clouds, forming ponderous masses, which imagination could shape into any forms, rose gently and majestically as the sun ascended, until the whole sky became overcast. An hour

before day-break the thermometer stood at 28° (Fahr.); two hours afterwards it rose to 75°, a difference of 47° in the space of three hours.

After breakfasting I descended six leagues, to a place called *Tambo;* the road, if so it may be styled, being so steep and craggy, that it is almost as difficult to walk as to ride down it, and frequently so narrow for the length of about half a mile, that two meeting mules could not pass each other; and in some spots neither of them could turn round to go back again. At other places the track is so furrowed into the ground, and so completely roofed over by timber trees that have fallen across, that it becomes a dark, subterraneous-like passage. On the coast of Peru, the usual load for a mule is twelve or fourteen arrobas, about 3 cwt.; but in traversing these mountain tracks, the strongest animal never carries more than six arrobas, or 1½ cwt., and they are commonly seven or eight days performing a journey of twenty leagues. The *Tambo* consists of two huts and a lodge.

On the following day, six leagues of very stony, hilly, and at places exceedingly swampy path, brought me to *Cosnipata,* the easternmost hacienda of the *Valle.* Here I remained three days, in the vain expectation that some of the *Chunchos,* or wild Indians, as those of Paucartambo are called, would make their appearance, as they occasionally do, although, until within the last few months, none had sallied from their fastnesses for upwards of two years, in consequence of a quarrel with the Spaniards.

On the 28th I rode with the administrator, or chief steward, to the estates called *Santa Cruz* and *Chaupimayo,* which, with San Miguel, Mugillo, and Huainapata, are situated from four to five leagues north of Cosnipata. This last and Chaupimayo produce each 1500 arrobas (350 cwt.) of coca-leaf annually, while each of the others yields from 500 to 1000 arrobas. The land also produces rice, cacao, yucas, camotes, Indian corn, pine-apples and other fruits, all in great abundance and of excellent quality, where cultivated, though very small quantities of those things are grown, owing to the laziness of the people who superintend or work on the estate, and whose almost only food consists of *chuno* (the blanched potato), *sesina* (sun-dried meat), and *aji* (capsicum). They are the same sort of filthy, immoral people I met in the valleys of Sant' Ana. A labourer earns two shillings a day; a woman, a boy, or a girl, who picks coca-leaf, earns two rials (1s.) Yet these people are always considerably in debt to their employers, and live so wretchedly, that they suffer dreadfully from ague and fever, and there being no medical attendance they die off numerously. The stewards are so incurious, that not one of them has ever penetrated a mile beyond his own estate. There is neither a priest, nor a chapel, nor a clock, nor a watch, in the

whole valley, although the number of inhabitants on the six estates amounts to at least 600. Excellent grass springs up in great abundance wherever trees have been felled, and some horned cattle are kept; yet neither butter nor cheese is used or manufactured. Vegetables are scarcely ever seen, although the soil and climate admit of the production of most sorts for the table. On two of the estates there are ten orange trees; and when I inquired why more had not been planted, seeing that these ten thrived so well, and yielded such delicious fruit, the steward replied, that want of leisure hindered them from attending to things of that sort. Indeed Cuzco has the worst supplied market of any city I was ever in; it is therefore not so surprising that the people of the remote valley of Paucartambo should be so far behind in the common necessaries of life.

On the 29th we returned to Cosnipata, and had no sooner arrived, than we received a message that ten or twelve Chunchos of the tribe called *Tuyoneris* had promised to remain at Chaupimayo till next day. Consequently we again set out for that place; but, on reaching it, I found that the visiters had suddenly departed, and that no entreaty could induce them to await my arrival. I determined, however, to follow; and, if possible, overtake them. Therefore, accompanied by an escort, I set out in full chase. One of the party, a mulatto named José, pretended to have penetrated, on a former occasion, as far as a broad navigable river, which he represented to be at the distance of eight or ten leagues, and which I was particularly anxious to reach. We proceeded on foot, being provided with large knives and hatchets to cut our way, when necessary, through the wood; provisions, and half a dozen old muskets and carbines, for self defence. It took us six hours and a half to accomplish a distance of three leagues, so tedious was it to cut our way through underwood; to stoop as we passed under low arms of trees; to avoid stumbling or breaking our shins against stumps; and to pick our way, there being nothing more to guide us than here and there a faint track made by the Chunchos, who seldom go in a straight line, or follow the same course twice, as when they travel with bow and arrow in their hand, they are always on the look-out for game, monkeys, wild boars, or the *gran bestia*. Besides which, they cross their feet as they walk, and keep their toes turned rather inwards, so that the track they leave is exceedingly narrow. We forded and re-forded, three or four times, the river of *Chaupimayo*, a difficult and painful operation, on account of its rapid current and stony bed, and at 5 P.M. bivouacked on the left bank. In the course of the night we were roused by the cracking of underwood, and by a noise which our party declared to be footsteps. Two sentries posted in advance fell back on our bivouac not a little frightened, and the rest of the

men ran to the remaining fire-arms. But, as nothing more was heard, all lay down again until dawn of day.

On the 1st of August we discovered the trace of a *gran bestia* near the spot. At 6 P.M. we renewed our march; forded the river *Ucucanchi*, which falls into that of Chaupimayo, and proceeded onwards, contending against the same sort of obstacles we met with the day before, but with greater uncertainty as to our direction, it appearing that our trusty guide was as ignorant of the course we ought to pursue as any of the rest of the party. We took care, therefore, not to get out of hearing, for any length of time, of the noisy torrent we had passed, and which could be heard to a considerable distance. My escort evidently grew timid in proportion as we advanced; their conversation turned exclusively upon the ferociousness of the wild Indians, and upon the facility of being lost in such a thick forest. It was only by a judicious mixture of supplicatory and menacing tones, that I was able to urge them to go forwards four leagues to the confluence of the Chaupimayo with a river* both too deep to ford, and so rapid as to be impassable, excepting to a very expert swimmer. At an angle formed by the junction of the two rivers, there were seen recent footmarks, near to some small sheds erected by the Chunchos, evidently for the accommodation of hunting and fishing parties, but none of our own men would proceed farther, for the reason already mentioned, and because we had provisions left for only two meals. Besides this, if it should come on to rain—a very probable event, since it does so in the valley of Paucartambo 300 days in the year—the Ucucanchi and Chaupimayo would swell so as to prevent our recrossing them. Accordingly, after a halt of two hours at the confluence, and leaving some presents of knives, scissors, and beads, in the huts for the Chunchos, we returned with all possible speed to the place whence we set out in the morning, and where we arrived, half worn out with fatigue, soon after sunset. On the following day at noon we reached Chaupimayo.

On the 4th I returned to Cosnipata, fully resolved to make another excursion in a new direction, better furnished with provisions, towards the habitations of the tribe called *Guatipaires*. Accordingly,

On the 6th I formed another party of the same number as the former, and at 10 A.M. we began our march in an easterly direction; forded the Cosnipata, and, after toiling as on former occasions, through an entangling forest for three leagues, and crossing

* General Miller calls this river the Paucartambo, but there must be some mistake, as shortly before he notices the confluence of that river with the Apurimac on the western side of the eastern Cordillera, whereas this river by his own sketch-map is flowing to the south-east.

a streamlet, we reached another torrent which had become impassable from recent rains. We therefore bivouacked under an Indian shed on its left bank.

On the 7th, although the flood was too much swollen to admit of fording it, corporal Guerra and two other men swam over, having orders to move forwards until he fell in with the Guaire Tenenpegua, otherwise called Captain Francisco, principal chief of the *Guatipaires;* and to inform him that Don Esteban Calderon, whom he had several times visited at Cosnipata, wished to see him, but was detained on the road. The rain soon after began to fall in torrents, and it was then only that we discovered the awkwardness of our position on an island in the centre of a river. It was not in our power to move off one way or the other, the shallow stream that we had crossed the day before having meanwhile changed into a foaming torrent.

On the 8th our little islet began, from continuing rains, to diminish in size, the roaring flood on either side was terrific; and the muddy, resistless rush of waters, carrying down with it huge stones, made the ground we stood upon tremble, so that every moment increased our anxiety. On more closely examining the narrowing space of dry land, we perceived that it must have been often inundated, for it had on the surface only a little brushwood and one small tree, up which we determined to climb if hard pushed, though it was dubious if it was equal to the support of our aggregate weight. Fortunately the rain ceased, and soon afterwards corporal Guerra and his two companions made their appearance on the opposite bank of the river, along with the *Guaire* Francisco, two of his wives, and five or six Chunchos, male and female. The long loose black hair and swarthy figures of the Chunchos, standing on the brink of a roaring flood, with an apparently impenetrable forest in the background, rendered the scene one of primitive wildness. In the evening, when the rush had somewhat subsided, Francisco swam across to us, but none of his comrades ventured to follow him. He embraced Don Esteban, but was considerably alarmed on first perceiving me and Garcia my servant, whom he said were strangers to him, and he had not been told anything about us. But he was soon made to feel at ease, and he then recrossed the flood to rejoin his wives and other companions, taking with him a few presents.

On the 9th they all paid us a visit, and were made to understand that I was a *Guaire* of soldiers from Lima, and that I wished to see their habitations. They expressed a great desire to go previously to Cosnipata, and it was only after a long debate that they consented to go to their own dwellings with us. It was decided, however, that we should pass a day where we were, as the river was still much swollen. The height of Guerra (who stands

six feet two inches), and my own, excited the attention of the Chunchos. They asked numberless questions, such as how many men each had killed; how I had been wounded in the hand, &c.; and on perceiving me look at a thermometer, at a pocket compass, and through a telescope I had with me, their curiosity approached to a mysterious fear.

On the 10th, four leagues of the usual pathless forest brought us to another flood which we partly forded and partly swam. A mile beyond this, on a rising ground, we entered Francisco's well-built house, which is a hundred feet long and forty wide; its walls six feet high, and has an excellent pointed roof of red straw, or rather of red leaf. The ends of the house are oval-shaped, and each end has a door, but there are no windows. The interior resembles a large barrack-room, having on each side wide stretchers made of cane. The whole of the Guaire's family and dependents reside in this building, and besides himself and wives the establishment consists of nine grown up men, three women, and a few boys, but there is ample accommodation for three times the number beneath the same roof.

The Guatipaires are the same sort of looking people as the Antes. They also perforate the cartilage of the nose and their lips, in order to suspend ornaments from them. They occasionally paint themselves, and decorate their heads and shoulders with feathers, but probably only on festivals. All appear to acknowledge the supremacy of Francisco, who is considered to be strongest, the most expert in athletic exercises, and the bravest man amongst them; he stands five feet ten inches high, is well made, of a good cast of features, of a jovial disposition, and not a bad mimic, of which he gave us many amusing instances. He was formerly a decided foe to the Christians, and is said to have been the projector and leader of many attacks against them, but his enmity was converted into friendship by the kindness he received in the course of a visit he, with two of his wives and two or three attendants, made in the year 1829 to Cuzco.

After partaking of a hearty meal we retired to our stretchers, thus resigning ourselves completely to the mercy of our hosts, for they could have easily seized our fire-arms, not more than two or three of which were in a serviceable state. I found it impossible to close my eyes, for the Chunchos formed a ring and began to dance, pulling each other round and round with one or two in the centre of the circle; this, with their dark, naked bodies, their black hair, flowing round their shoulders and half way down the back, with their discordant jargon and unintelligible chattering or singing, formed altogether a novel scene during the first part of the night. During the remainder, some of them were constantly on the move about the room, gliding like dusky spectres, and tread-

ing so lightly on the earthen floor as not to be heard, whilst others would at short intervals rise from their stretchers to place a few dry sticks on one of the eight or ten fires that were kept flickering all night long, and which were alternately made to produce a blaze, the only light they have: I believe that they are afraid to be in utter darkness at any time, on account of evil spirits; but as they sleep so much in the day-time they do not of course require so much rest at night.

The Chunchos appear to be in no want of the means of subsistence. They cultivate Indian corn, plantains of all sorts, yucas, pine-apples, and other fruits, and if they have not a surplus of these good things it is solely because they shrink from agricultural toil. They prefer wandering for leagues and leagues through their matted forests in pursuit of game, and shooting fish called *sábalos,** in the river, to undergoing the smallest exertions in the clearing or tillage of a patch of ground. They make six or seven meals in the course of every twenty-four hours, boiled plantains and Indian corn being their standard dish, but they evidently preferred partaking of our provisions to their own. They are particularly fond of tea and sugar, but have a great dislike to salt, which they never use in any way. *The Pavon,*† a sort of small turkey covered with black feathers, excepting two or three white ones in the tail, is their favourite game. They roast it without plucking its plumage, but which of course soon singes off. None of the Chunchos can ride on horseback.

As far as I could ascertain the Chunchos have no religion whatever, and the few ideas they expressed of the Supreme Being were evidently acquired from the Christians they have come in occasional contact with. Marriage consists in mutual consent, a mere agreement, celebrated by a fishing party and a dance. Although polygamy exists few of the men have more than one wife. It is said that the women are chaste, and that wives are faithful to their husbands, who do not however relax in vigilance. The proportion of females we saw was very small to the number of men, and still smaller that of persons over forty and under fifteen years of age. Ague, and a complaint in the nose which often proves fatal, and ulcers on the legs or body, are the most common diseases. They bury their dead under their stretchers, in a sitting posture with arms and legs bound.

On the 11th we rose at day-break. It was my wish to extend our jaunt farther to the east, or rather to the bank of the navigable river (called *La Madre de Dios*), which flows at the distance of

* Sábalos is a name given to several species of fish, in the rivers of South America, possibly a species of salmo.

† This name is given by the Spanish Americans of South America to several species of the genus Crax, or curassow-bird.

half a dozen leagues from Francisco's habitation, but Francisco and other Guaires were opposed to our proceeding any farther. They said that the woods were absolutely impenetrable to us; that the distance to the river was greater than we reckoned; and started numerous other obstacles. This being the case, and there being every probability that it would soon come on to rain, we set out on our return to Cosnipata, accompanied by three Guaires, and sixteen of their men and women. The latter carried all the provisions in bags of their own manufacture, placing a broad band round their head to support the burden, which hung down at the back. They likewise cooked and performed every other menial service. The wives of Francisco appeared to be on the best possible terms with each other, and to live together like sisters. We crossed the river with less difficulty than before, and, after walking nearly the whole of the day as fast as I could, we reached Cosnipata at sun-set.

We were all particularly merry throughout this day's journey, and Francisco more than commonly diverting. He sang a great many songs, two of which were called, "The Wild Boar," and "The Parrot." Then he chaunted the *Alabado* (Laus Deo), in imitation of what he had heard at dawn of day, when on a visit at Cosnipata. Four or five Chuncho lads who accompanied us displayed great acuteness in decoying birds and monkeys in the tops or branches of trees, and the least noise that was heard they knew whence and from what it proceeded. The trail of a herd of wild boars, and the track of some of the gran bestia, were also pointed out to us.

On the 13th Francisco and his companions left us on their return home, having obtained from me all the presents I had to give them. On the following day we set out on our return, and slept at the Tambo.

On the 15th I slept at *Las Tres Cruces*, and on the 16th of August reached Paucartambo.

The results of these journeys may not at first sight appear to add much to our knowledge of the geography of this part of South America, yet in the first trip towards the north 130 miles of ground were gone over, and in that to the eastward more than 150 miles, of a country rarely, if ever, trodden by any European foot, and of which no published account, we believe, exists; but the chief value of this latter journey is its probable bearing on a very doubtful point in the hydrography of these vast plains, namely, the sources, the tributaries, and the general course of the great river Purus, which, from the published account of Lieut. Smyth, R.N., and also from a paper contributed by that enterprizing officer, inserted at p. 11, 1st part of vol. vi., of this Journal, is known to be one of the largest affluents of the river

Marañon, or the Amazons. In speaking of it at page 13, he says, "the river Purus has four great mouths by which it rolls its waters into the Marañon, the largest of them a mile and a half broad, and we could get no bottom with a line of twenty fathoms;" and again, "of all the unexplored streams which fall into the Marañon, this appears to me to be by far the most deserving of attention, and to be that which affords the most promising prospect of a communication with Bolivia." Also in a valuable document, translated by Mr. Woodbine Parish from a MS. of Thadeus Hænke, where, at p. 94, vol. v., speaking of the Purus, or Cuchivara, he says, "I have data sufficient, I think, to fix its sources between the Cordillera of Vilcanota and the east of the mountains of Carabaya;" and again, "the Indians who live to the west of Apolobamba, give me accounts of a wide and deep river running through a flat and thickly-wooded country, about ten days' journey west of the river Beni—that a vast many Indians were settled along its shores—and that in their language it was called Manoa."

Now in the annexed sketch-map, sent home by General Miller from Cuzco, on which his journeys are traced, the river that he reached about forty miles to the eastward of the Andes is represented as having its sources in the Cordillera del Este, thence holding a course to the south-east, and receiving several tributaries from the eastern declivity of the mountains, till it reaches a spot about ten miles to the southward of the post of the chief of the Chunchos Indians, in 13½° south lat., where it again bends towards the north-east, in the direction of the vast level Pampas, and is here represented as a 'rio manso y navigable'—a smooth and navigable river. May not this eventually flow to the Purus? —or if not, it proves that water communication, probably navigable by steam-boats, exists through the midst of the Pampas, up to the very foot of this part of the Andes.

We are aware that this information rests, possibly, only on the authority of the Indians, but it appears to have been gained on the spot from persons who, when they have had no interest in deceiving, have usually been found correct; and it is here stated to invite research and to elicit the truth, rather than as any positive data on which to correct our maps; yet by those best informed on that part of South America it is believed this will be found correct. Should it prove so we shall be spared the improbability of a large river "with four great mouths," rising in the midst of a great plain, some hundred miles from any mountain range.

We may notice here that the position of Cuzco is not, we believe, astronomically determined*; and may we venture to suggest

* Alcedo gives it in 13° 42′ south lat., and 71° 4′ long. west of Greenwich, from unknown sources, and Coulier and others repeat it.

to some one of the numerous officers employed on the South American station, that Cuzco is but about 250 miles, over a fair road, from the Port of Islay, near Arequipa; and that a week's journey, could he be spared, would enable him to go there and return to his ship, after having fixed the position of the celebrated capital of the Incas.

* * * *

Since the above letter was written an important change in the political limits of the countries, described by General Miller, has taken place—a change to which our author's military talents have materially contributed, and which it is right here to notice.

In consequence of the defeat of the Peruvian chief Salaberry, in February, 1836, by the united armies of Bolivia and Peru, the representatives of the four southern provinces assembled at Sicuani, on the 17th of March last, declared their separation from the Republic of Peru, and their incorporation into an independent state under the title of Estado sud Peruano.

This new state embraces the four provinces of Cuzco, Ayacucho, Puno, and Arequipa; the largest portion of territory is situated in the Andes, or in the valleys descending from that chain. They are inhabited by a very numerous, agricultural, and industrious Indian population, and have hitherto formed the fairest portion of the Peruvian confederation. No capital had been decided upon at the date of our last advices; but it is probable that Arequipa, from its commercial prosperity and vicinity to the seacoast, will be selected as the future seat of government.

The assembly of Sicuani have very properly placed their country under the protection of General Santa Cruz, the enlightened president of Bolivia, whose administration of that republic, since 1829, has rendered it the model of good government, internal tranquillity, and financial prosperity.

In a geographical point of view, the political changes to which we have alluded are not without importance. The time appears now arrived, when the solution of the question touching the course of the great rivers that empty themselves into the Amazons, between the Huallaya and the Madeyra, may be expected. And we anticipate with confidence that a question of so great importance, in a commercial point of view, will not escape the notice of the patriotic government of Bolivia, and of its highly-gifted President Santa Cruz; and that ere long the productions of the rich provinces of Apolobamba, Moxos, and of the other countries situated on the eastern declivity of the Andes, will find their way to European markets by the less circuitous route of the Amazon and its confluents.

His Majesty's government has lately appointed a consul-general to proceed to Bolivia.—Ed.

Sketch
of a Route to the
Northward and Eastward of
CUZCO
By General Miller
July 1835.

5 10 20 30 40 50
English Miles

71 70

11
12
13
14
15

R. Urubamba
Antes
El Encuentro
Coribambilla
Incharate
Chaco
Sta Ana
Chancamayo
Buenos Ayres
Chinche
Huiro
Ocobamba
Colca
Pantiaille
Larca
Tambo
Urubamba
Huallabamba
Calca
CUZCO
Oropesa
Andaguaillos
Urcos
Caycay
Quiquijana
Checacupi
Combapata
Tinta
Siquani
Marangani
Agua Caliente
Sta Rosa
Paucartambo R.
Paucartambo
Tres Cruces
Ocongate
Cordillera del Este
Cordillera de Vilcanota
Chuncho
Tuyoneris
La Madre de Dios
R. Chaupimayo
Chaupimayo
Cosnipata
Tambo
Casa del Inca
Asaroa
Mt of Carabaya
Crucero
Sandia
R. Yambari
R. Mano Supposed to be the R Purus
Gualupares

Longitude West from Greenwich.

72 71 70 69


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John Arrowsmith

XIV.—*Journey through a part of Armenia and Asia Minor, in the year* 1835. Communicated by James Brant, Esq. His Majesty's Consul at Erz-rúm. July, 1836.

Asia Minor consists of a high mass of mountains, supporting a table land which presents a succession of extensive and fertile plains, running in general east and west. In the highest parts rise the great rivers of Armenia, Anatolia, and Mesopotamia, the Kur or *Cyrus*, which waters the whole of the province of Georgia, and receives numerous tributaries from Caucasus; the Aras (*Araxes*), which flows round the foot of Mount Ararat and joining the Kur, falls into the Caspian, and the Jórúk,* or *Acampsis*; the Chái-shambah Sú,† or *Iris*,—and the Kizil Irmák,‡ or *Halys*, the largest river of Asia Minor, which traverses, in a circuitous route, nearly the entire breadth of the Peninsula; the three last flow into the Black Sea; —the Tigris and Euphrates, which, after a course of upwards of a thousand miles, enclosing the large and celebrated plain of Mesopotamia, now Al-Jezírah, unite and fall into the Persian Gulf. On its northern side, this mountain-tract overlooks the Black Sea, on the south, the Mediterranean and the plains of Mesopotamia and Syria. Between the Black Sea and the base of the mountains, there is generally a strip of level land of greater or less breadth, which sometimes, as in the province of Jáník, widens into broad plains. Where these plains do not occur, the mountains, at a distance of about 12 hours, or 24 miles from the sea, attain their extreme height of between 6000 and 7000 feet. Before the central table land is reached, there is a triple range running east and west. The Chái-shambah Sú holds a course parallel to this range, until it bends round the western end of it in longitude 36° 30′ E., and enters the sea at Sámsún.§ The Jórúk bounds its eastern extremity near Bátúm, where it falls into the Euxine, in longitude 41° 30′ E. The range is partially cut through in one place by the river,‖ which, rising near Gúmish-khánah,¶ empties itself into the sea at Tírehbólí, about 60 miles to the west of Trebizond. The whole range of mountains, from sea to sea, is limestone. Volcanic rocks frequently are found, first on the northern face near Trebizond, then at Erz-rúm, at Diár-bekr, and at Kaisar; between Gúmish-khánah and Trebizond, granite rises up occa-

* Jorokh or Horokh in Armenian, Choroki in Georgian, and Chúrak or Chûrûk in Turkish.

† That is, Wednesday-water, probably from a village of which the market is kept on that day of the week; by Turkish writers it is called Yeshíl Irmák, that is, Green River.

‡ Red River.

§ The ancient Amisus.

‖ Kharshút in Lapie's Map; Goumache-khaneque (Gúmish-khaneh-sú, Silver-house River) in Darmet's, copied from the Russian Map of 1819.

¶ Silver-house.

sionally. The mountains abound in veins of copper and lead, the last being rich in silver. Mineral springs frequently occur, most of them hot. Towards the Black Sea, the mountains are clothed with forests to an elevation of about 4500 feet; but above that height, the country in general is bare of trees, although, in some recesses of the mountains, forests exist even in the central more elevated parts. The passes from the coast are numerous, but, excepting those which follow the valleys of the great rivers, they are difficult, and many are open only in summer. The soil is, for the most part, fertile, and the country well watered. The population may be considered as small in proportion to the land susceptible of cultivation.

Trebizond, situated on the southern shore of the Black Sea, has been a place of importance almost since its first foundation by the Greeks, in ages beyond the reach of authentic records. It was at this city that Xenophon reached the sea on his celebrated retreat with his 10,000 Greeks after the defeat and death of Cyrus the younger at the battle of Cunaxa in Mesopotamia. It is impossible to trace his route from Xenophon's account of the retreat, but unless the face of the country be entirely changed, the pass, by which he crossed the mountains in order to reach Trebizond, must be the same now in use, since no other is practicable in winter, and it was during that season the passage was effected by the Greeks.

At the period of the Roman dominion over Asia Minor, their trade with India is supposed to have passed through Trebizond; and in later times the Genoese brought the productions of Hindostan from Ispahan to Trebizond, and from thence conveyed them through Caffa in the Crimea, and afterwards through Constantinople to Europe.

The sovereigns of Armenia permitted the Genoese to establish a line of fortified stations through their kingdom to the frontier of Persia. Trebizond was the first, and Byazid the last, of these stations. They were between 25 and 40 miles apart, and were always in commanding and defensible positions, surrounded by solid and extensive walls, within which were quarters for the guards and shelter for the horses and merchandise of the caravans. In their progress from station to station, in order to secure their safety, the caravans were furnished with escorts, more or less numerous according to the state of the country. Baibût and Erzrûm were two of their strongholds; and the solidity and extent of the fortifications there, and at other places, show the importance the Genoese attached to their trade; the profits of which must have been very large to have sufficed, not only to meet such immense expenses, but also to have enriched the republic.

After the expulsion of the Genoese from Caffa, about the middle

of the fifteenth century, and the extinction of the independent principality of Trebizond on the capture of the city by Mahomet II., which occurred nearly at the same time, the commercial relations between Trebizond and Europe ceased entirely, and the Euxine became closed to the navigation of Christendom.

That the Black Sea has been gradually re-opened to European vessels has been owing to treaties extorted by Russia from Turkey at various periods, at the point of the bayonet; and the last treaty (that of Adrianople) finally rendered every part of the Euxine accessible to the commercial flag of all the nations of Europe.

The old channel of communication with India and Persia has thus been once more resumed. It is not probable, however, that it can at the present day be made available for an Indian trade with Europe, because more economical routes are now open; but that it is the most eligible channel for an intercourse with Persia and the circumjacent countries, has been placed beyond all doubt by positive results, in proof of which the rapid increase of the trade may be adduced. In 1830, only 5000 bales of European merchandise passed through Trebizond on their way to Persia, while in 1835, nearly 20,000 proceeded by the same track to the same destination.

There are no remains in the city, nor in the neighbourhood, of buildings of a more remote age than the Christian era. The number of churches is great; for independent of nearly twenty churches and chapels still retained for the service of the Greek church, almost all the mosques have been Christian churches. The handsomest is that of Santa Sophia, which is situated a mile to the west of the city; it is still in a good state of preservation externally, and although it has been converted into a mosque, it is seldom used by the Mohammedans.

The town is built on the slope of a hill facing the sea; part is surrounded by a castellated and lofty wall, and is in the shape of a parallelogram. On either side of the walled portion of the city is a deep ravine, filled with trees and gardens, and both ravines are traversed by long bridges. Overlooking the city is a citadel, which is rather dilapidated and neglected; it is commanded by neighbouring heights. The gates of the city are closed at sunset, and the walls are in sufficient preservation to serve as a defence against an attack by troops unprovided with artillery. Many fragments of marble and of inscriptions, remains of more ancient structures, are worked into the walls. Over one of the principal gates is a long inscription, which refers to a Christian bishop and one of the emperors of Constantinople; it is evidently not in its original position. The walls and citadel are generally, and no doubt justly, attributed to the Genoese.

Below the town is a small port, intended probably for row-

galleys. The beach between the city and the sea was enclosed by the walls of the town on both its sides, being prolonged till they joined the quays. The port was thus rendered inaccessible by land, except from the town, and the communication between them could not be interrupted. The quays were of masonry, and surrounded the whole port, leaving only a narrow entrance: the upper parts have been washed away, but enough of the masonry remains under water to break the violence of the sea, and to give protection to boats and small craft by which the port is still frequented.

There is no port for ships; a small open bay at the eastern extremity of the town is used as an anchorage during the summer. After the autumnal equinox, the Turkish and European vessels resort to Platana, an open roadstead about seven miles to the west of Trebizond. But British vessels anchor at all seasons at Trebizond; and the anchorage there, in winter even, appears to be quite as secure as that of Platana. The bottom is excellent holding ground, and with good ground-tackle, a ship would ride safely in the heaviest weather. The high mountains covered with snow prevent the wind from blowing home on this coast; and during the severest gales there are, at short intervals, lulls of wind and sea, and there seldom is a night during the whole year in which the wind does not blow off the land.

The houses of the town contain for the most part a ground-floor alone; and all having a yard or a garden with a few fruit trees, scarcely a house is visible from the sea, and the town has the appearance of a forest when the trees are in leaf.

The city contains between 25,000 and 30,000 inhabitants. The Greeks may be estimated at 3500 to 4000, the Armenians at 1500 to 2000, and the Mohammedans at 20,000 to 24,000. The walled part of the city is inhabited solely by the latter; and that portion without the walls contains the Christian population, some Mohammedan families, as well as the bazars and khans. The natives of all sects, whether Christian or Mohammedan, are unfriendly to Europeans, and are an ignorant, rude, and bigoted race.

From the period of the expulsion of the Genoese and the capture of Trebizond by the Turks, its commerce dwindled into insignificance; and previous to 1830 it consisted in the export of a few products of the country to Constantinople; in the import of iron from Taganrog, a Russian port in the sea of Azof; and in a traffic with Abassah carried on in small craft, which transported salt, sulphur, lead, and considerable quantities of the manufactures of Turkey, receiving in exchange from the uncivilized tribes of the Caucasus their various raw productions, as well as a great number of male and female slaves.

The blockade of the coast of Abassah by the Russians, with a view to the subjugation of the Caucasian tribes, and to the extinc-

tion of the traffic in slaves, has annihilated the trade between Abassah and Trebizond; and the native merchants have since turned their attention towards that of Constantinople, which has, in consequence, increased, together with the consumption of European manufactures.

The country immediately around Trebizond has few productions,—objects of a commercial exchange with Europeans. Tobacco, bees'-wax, hazel-nuts, honey, butter, and kidney-beans, are exported from thence to Constantinople. The neighbouring mountains abound in rich veins of copper and lead ores, but the system of working mines in practice prevents the development of this rich source of national wealth.

The present importance of Trebizond is derived almost solely from its being the most convenient point of debarkation for merchandise destined for Armenia and Persia; but it is not improbable that a relaxation on the part of the Turkish government with regard to monopolies, and a change in the tarif now in operation in Georgia, may one day occasion Trebizond to become an interesting commercial mart, independent of its transit trade to Armenia and Persia.

I embarked at Trebizond on the 19th May, 1835, in a galley, and kept along the shore to the Russian frontier, a distance of 60 hours, or as many leagues, passing in succession the districts of Yomurah, Surmenah, O'f, Rízah, and Lázistán. All these, however, except O'f, are known under the general name of Lázistán, and the people are called Láz. The O'flís have peculiar habits and customs distinct from those of the Láz.

The picturesque beauty of the coast is particularly striking. The mountains rise immediately from the sea from 4000 to 5000 feet, clothed with dense forests, composed principally of chesnut, beech, walnut, alder, poplar, willow, and occasionally small oak, elm, ash, maple, and box, the higher parts being covered with fir. No ship-building is carried on in this part of the coast, and there is no exportation of timber, (a general prohibition existing against it in Turkey,) so that the forests supply only charcoal, firewood, and timber for the construction of houses and of boats used in the coasting trade and fisheries.

The country is so wooded and mountainous, that it does not produce grain sufficient for the consumption of the population, yet not a spot capable of cultivation appears to be left untilled. Corn fields are to be seen hanging on the precipitous sides of mountains, at which no plough could arrive. The ground is prepared by manual labour, a two-pronged fork, of a construction peculiar to the country, being used for this purpose. Indian corn is the grain usually grown, and it is seldom that any other is used for bread by the people: what the country does not supply is procured from Guriel and Mingrelia.

The people are a hardy, laborious, and bold race, they are skilled in the use of a short rifle, which every man carries slung at his back, wherever and on whatever occasion he moves, and they enjoy a high reputation as soldiers. A demand is always made on this country by the Porte to supply a certain number of men for the arsenal at Constantinople.

A general census of the full-grown men in the empire, capable of bearing arms, was lately taken; the result gave for O'f, 24,000 men, and for Lázistán, 18,000 men. O'f has a very small extent of coast, but inland it spreads more widely, and runs nearly to the Jórúk, being bounded by that river and Lázistán. The O'flís in many of their habits much resemble the inhabitants of Maina in the Morea, carrying on blood-feuds from father to son; but when out of their own country, they are peaceable, and give their attention to commerce. They are represented as wealthy, having good towns, and houses of a better description than are usually found in these countries. Their country is very mountainous and inaccessible, particularly in winter; but, from their character, strangers seldom venture among them, and very little more is known of them, than that they are a fierce and independent race.

There are no towns in Lázistán: in Surmenah, Rízah, A'tenah, Khópah, and Bátúm, places all situated on the coast, there are bázárs, which consist of a street of shops, together with one or more coffee-houses, and a khán or two. At these bázárs a weekly market is held. The inhabitants live in cottages scattered singly over the country.

Surmenah and Yomurah, contiguous to Trebizond, may be considered as belonging to it; the people, being in constant contact with the townspeople, are more civilized than the Láz generally are.

Rízah is an important and fertile district, with the most extensive bázár on the coast. The climate is milder than in other parts: oranges and lemons are produced in the open air, shelter for the trees not being required in the winter months as it is at Trebizond. Rízah is famous for the manufacture of a linen made from hemp, used throughout Turkey for shirts.

A'tenah is a very insignificant place, with a small bázár.

Between Khópah and Trebizond no places on the coast communicate by caravans with the interior. There are passes from Surmenah, O'f, and Rízah, which are only practicable in summer, but I believe merchandise is never transported by them even then.

Khópah is an open roadsted where goods are landed, which are destined for Atvin,* a small manufacturing town on the river Jórúk, three days' distant from the coast. Sometimes goods

* Probably Artvani of Lapie, and Artzani of the Russian Map, on a tributary to the Jórúk.

destined for Ahkiskhah are landed at Khópah, and carried through Atvin; but more generally they are landed at Bátúm, and conveyed by the Ajerah, or Kúlah valley.*

There are numerous summer anchorages all along the coast from Trebizond, as also several which are considered safe, and used in winter, but there is no port except at Bátúm.

Bátúm is well sheltered, and its bay is capable of containing a large number of ships, but it is an unhealthy station, and those who venture to reside there from July to October are exposed to severe attacks of fever. The port owes its existence to the river Jórúk, which, falling into the sea some miles to the westward of Bátúm, has deposited, between its present channel and that place, a large tract of alluvial soil forming the western side of the bay. The sea has thrown up a bank of shingle which forms a border to this peninsula, leaving the land within it raised very little above the level of the sea, marshy and covered with brushwood,—these marshes occasion the unhealthiness of the place. The bázár is situated on the western side of the bay, close by the sea; it contains about sixty shops, several coffee-houses and kháns, and a mosque, all built of wood. Many buildings were in progress, and the place had the appearance of a newly-settled colony. There are a few small houses built, and gardens cleared in the brush-wood behind the bázár. The eastern side of the bay, opposite to the bázár, is healthy, and were a town placed on the rising ground there, it might be inhabited safely at all seasons, and would be placed beyond the influence of the marshes, since the breadth of the bay at that part is between two and three miles. Every person is obliged now to shut up his shop and quit the place during the sickly season.

The river *Jórúk* is the boundary between the Páshâliks of Trebizond and Kárs; Bátúm lying to the eastward of it, is consequently in the latter. It is one of the larger rivers of Armenia, uniting the waters of the Kúlah, or Ajerah valley, the Marsat Dereh, near Báïbút,† and of all the valleys on the western and northern sides of the mountains, in which are the sources of the Kur, Aras, Arpah-cháï (*Harpasus*), and the Kará Sú, or Western Euphrates,—these rivers serving as drains to the valleys on the opposite sides of the chain. Rafts come down the Jorúk from Atvin to the sea in three days, and sometimes, though rarely, track up against the stream in eight or ten; but from what I could learn, the river would not probably be navigable for boats, on account of rapids and rocks.

The country throughout is without roads; during the winter a direct communication with the interior across the mountains is

* To the N.E. of Bátúm.

† Báïbút, or Paipurth, in Armenian; purth means castle.—A.

impracticable, and between places on the coast it is usually kept up by sea.

The Russian Frontier, at about eight hours distant from Bátúm, and two beyond the bázár of Chórúk Sú, is formed by a river called the *Shefkatil Sú*, which rises in the mountains that run eastward and northward from the bay of Bátúm, and form the southern boundary of a vast plain. The river crosses this plain obliquely, holding a north-western course, and detaching from the rest of the plain, a small portion which is bounded by the river, the mountains and the sea, and which has been left in possession of Turkey. On the northern bank of the Shefkatil Sú, there is a small Russian fort called St. Nikolaï, where is a quarantine-station.

Chórúk Sú possesses a more extensive bázár than Bátúm, with several coffee-houses, and a mosque; but there are no dwelling-houses, except that of the Bey. The persons who have shops in the bázár, are partly strangers from the coast of Lázistán and partly natives, the latter live in the contiguous mountains, and once a week, on the market-day, frequent the bázár, which is well attended. The Láz quit the place at the unhealthy season, in the autumn, and return when it is past. There is no harbour here, and I consider that, as a place of trade, it will soon be superseded by the more eligible station of Bátúm, where everything has the appearance of improvement, while at Chórúk Sú, things seem in gradual progress of decay. The district is a dependency on the Páshálik of Kárs. The house of the Bey is on the shore close by the bázár, and was intended to have been enclosed in a fort, which was begun after the conclusion of the Russian war, but it was never proceeded with beyond the foundations. The bazar is built on a steep bank of shingle, thrown up by the sea, which being higher than the plain behind, protects it from the encroachments of the sea. The streams flowing from the mountains across this low flat run in sluggish currents, and, after heavy rains, render it a complete marsh, and having forced very deep channels through the shingle bank, empty themselves into the sea. Beyond the plain, which is in general narrow, commences a wood-land, which continues in the direction of the mountains to their base at the distance of about four or five miles.

At Chórúk Sú I quitted the boat and commenced my journey by land. I had entered the Páshálik of Kárs on passing the mouth of the river Jórúk, and had now to traverse the country as far as the city, whence it takes its name. The distance, by my line of route, was about 120 miles to Digwír, close on the Russian frontier, and thence to Kárs by Ardahán, about seventy miles. The country, until I reached the heights above Digwír, was very mountainous and woody, the summits themselves were pastures without wood; thence descending into Poshkov, there is a suc-

cession of rich plains, without any trees, excepting occasional pine forests in the recesses of the mountains, which border and divide the plains.

On this journey of 1500 miles I travelled as consul, and was furnished as such with a firman from the sultan. My suite consisted of a drogoman, a tatar, and two servants, and I had usually twelve horses including those of two guides. The loads, for the sake of dispatch, were light. My rate of travelling was between ten and sixteen post-hours a day; from 30 to 48 miles. The current expenses of horses, lodging, &c. amounted to about 30*l.* every 100 post-hours, or 300 miles. This was independent of presents, tatars, guards, and some incidental charges to which a private traveller would not be liable. I was treated by every body with great attention. Guards were always appointed, and although seldom (and I may almost say never) required, yet I could not, without offence, decline the compliment, as such they were intended, and such I considered them.

On the cross-roads post-horses are seldom found, but the villagers are obliged, and are in general quite willing, to furnish them at the post rate of one Turkish piastre (2½*d.*) per post-hour, three miles. I was but occasionally detained long for want of animals. I think a traveller, making moderate dispatch, with a small quantity of baggage and not many attendants, would find 30*l.* per 100 hours adequate to all his expenses. I would include in this his tatars' pay, and every expense.

The peasants who receive the traveller in the villages are generally content to leave their remuneration to his generosity. I seldom have found them dissatisfied with what I gave, but a few instances of the contrary did occur, and I am sorry to say it was generally in the poor Christian's house. I universally found the Mohammedans civil, ready to give all they had, and grateful for whatever they might receive.

In towns I was usually allotted quarters in the house of some wealthy Armenian, and was always well treated by them. My entertainers would seldom make any demand or accept money; in such cases a trifle was presented to the wife.

Quitting Chórúk Sú, I crossed the low meadows situated behind the bázár, passed through a narrow wood, and commenced ascending, by a beautiful but wild mountain gorge, the valley of Khino. The forest scenery was as magnificent as can be conceived; the trees of the same description as those in Lázistán, but of far larger dimensions. The first night was passed at a village named Jaghát, the houses of which were not collected together, but dispersed among the woods. Wheat is not grown here, but Indian corn, millet, and some rice are cultivated: the winters are not severe, but the summers and autumns are wet, and on that

account the harvest often fails; for two years past, enough had not ripened for their consumption. Fruits of the commoner sorts are abundant and good, and grapes enough are grown to make wine. The next day, continuing the ascent through a similar country, and the same kind of scenery, I passed a straggling village named Zerehbozel, and in the evening reached my night's quarters at *Didewaghi*, situated directly under the pass of the Kolowah Dágh, containing eighteen families, with the houses collected together. The whole valley is under the Bey of Chórúk Sú. The height of the village above the level of the sea, I should not estimate at more than 4000 feet, but the long winters of nearly eight months' duration, the foggy and wet summers, and early autumns, render agriculture there a very precarious occupation. The arable land is of small extent, and, in favourable seasons, will not yield the inhabitants above a six months' supply of grain. They have but few cattle or sheep from the impossibility of procuring winter fodder, which must be given for nearly eight months. The inhabitants are a very fine race, and show their Georgian mixture in their handsome features: they speak Georgian generally after reaching Bátúm, and in the valley through which I had passed, many of the natives did not understand Turkish at all. The men always go about armed with a rifle and a khammah, or large double edged knife, and they still have suspended from their girdles a knot of cord, which, though but ornamental now, served formerly to bind any captive Georgian they might meet in their rambles.

The country is very difficult, there are only mere footpaths through thick forests and beside dangerous precipices. Caravans do not attempt this road ; they go from Bátúm up the Kúlah or Ajerah valley.

From hence there are two passes to cross into the Ajerah valley, one by the Perengah Dágh * and down the Juwánah valley, the other over the Kolowah Dágh and down the Akó valley. The Perengah Dágh pass is to the eastward of the other, and is the more difficult pass, but it makes a shorter cut, and runs near the Russian frontier. I had wished to go by it, the state of the snow, however, prevented the possibility; even by the Kolówah Dágh it was necessary to place my baggage on the backs of men, as laden horses could not pass, and from the extreme steepness of the mountain I was obliged to walk both up and down. The side I ascended was clothed with forests of the largest beech-trees I ever saw. The summit of the mountain was, on the 30th May, still covered with deep snow which was fast melting; on the upper part only a few stunted juniper bushes and spruce fir were growing, but the summit itself was bare. The descent into the valley

* Dágh [tágh] means mountain.

of A'ko, was extremely steep and long; it took me four hours to ascend and as many to descend, including our numerous rests. A'ko is a pretty valley, and contains about sixty families, who seemed in easy circumstances, for the valley was well cultivated, and there appeared to be a sufficiency of land. The climate is temperate; rye and Indian corn are grown, but not much wheat; a small quantity of silk also is produced. The cattle are fed in the pastures on the Perengah Dágh, and when they encroach on the Georgian territory about ninepence per head is exacted for the grass, during the summer months.

The character of the people seems very much to resemble that of those on the other side of the range just passed; they look like Georgians, and speak the language.

From A'ko I descended into the Kúlah or Ajerah valley, through which runs a very considerable river, uniting with the Chórúk before it falls into the sea near Bátúm. On reaching the banks of the river, I got into the direct road from Bátúm, and about two miles beyond passed the opening of the Juwánah Valley, down which descends the road over the Perengah Dágh pass.

The forests on this side differ entirely in character from those on the other side of the range. Here they are quite alpine, and consist principally of small oak, mixed with Scotch and spruce fir. As the mountain is ascended, the oak disappears, and in the higher part are found only the spruce fir, with a few birches and alders. Along the valley as high as Kúlah, villages are of frequent occurrence, and there would appear to be sufficient cultivation to supply the wants of the inhabitants.

The roads in the Kúlah valley, below its junction with that of A'ko, were represented as more difficult than those in the upper part.

Kúlah, the hereditary possession of Ahmed Páshá of Kárs, at about sixty miles from Bátúm, is the principal place in the valley, and contains with its immediate neighbourhood, about sixty houses and a bázár with twenty shops. The climate is good, for grapes ripen here readily and wine is made, but higher up the valley no vines are to be found.

Continuing up the valley we reached at its head the village of *Danesvorólah*, having one hour previously passed the small one of Reged, where the Āghá of the district resides. The distance from Kúlah is about twelve miles, but the rocky nature of the road, and the frequent circuits we were obliged to make to cross torrents, fatigued our horses and made our progress slow. The woods and mountains showed an elevation of probably 5,500 feet, and the snow lies so long on the ground, that it often happens that grain does not ripen. An additional proof also of the severity

of the climate may be adduced, viz., that above the pine forest, which is immediately over the village, the birches and alders were, in the commencement of June, only beginning to put forth their buds. On every side are most luxuriant meadows yielding pasture for a fine breed of cattle, which are numerous.

Danesvorólah is chiefly inhabited by persons who have quitted the territory ceded to Russia, and who have been located here, until they can find a more eligible place of residence.

Immediately on quitting the village the road ascends through a pine forest for an hour, when the summit of the range is reached; where are extensive pastures, used by the natives of the contiguous valley, as the summer grazing grounds of their herds and flocks, but these pastures are free from snow only between three and four months, and even at the season in which I was there, on many parts the snow lay so deep, that my baggage horses had great difficulty in getting through it.

From the heights, there is an easy descent into the plain of *Poshkov*. The country as well as the natives assume now a character perfectly distinct from those on the opposite side of the mountains, where the country is mountainous and wooded; the houses are all of timber, the language Georgian, and the people a fine, tall, handsome race. On this side the country is open, or rather it is a succession of plains without wood, except in some recesses of the mountains; the habitations are the underground houses of Armenia, and the people talk only Turkish, and bear the distinctive features of the Armenian race. The whole tract is well adapted to the growth of grain, as well as for grazing, and, although now depopulated from the consequences of the war, will probably be soon again occupied. The Sanják of Poshkov was retained by the Russians until the definitive settlement of the frontier, and either on their evacuating it, or during the occupation, all the villages were destroyed; some, however, are now in progress of restoration, but many still remain in ruins.

I passed the night at the village of Digwír, where the Bey of the Sanják of Poshkov resides; on leaving it I crossed a high mountain range, without a tree, with but few villages and little cultivation; affording scarcely more than summer pasturage to the flocks and herds of some Turkomán tribes. In some of the sheltered recesses on the slopes of the mountains, there are fir forests, but not any trees, either on the summits of the mountains or in the lower plains. From the range, I descended into the rich plain of Ardahán, watered by the Kur; the upper part is marshy near the sources of the river, and serves merely to pasture large herds of cattle, the lower part is well cultivated and productive.

Ardahán formerly contained 300 houses, but it was occupied and destroyed by the Russians, and now numbers only 70 families.

The houses are, like those of the villages of Armenia, underground; a method of construction adopted on account of the severity of the climate. There is a fortress, but it was dismantled by the Russians and the guns taken away; it is, however, commanded by neighbouring heights, and never could be made a place of strength. Within the castle walls is a large house, belonging to the Bey, as, also, other houses built of stone and above ground, but most of them are now in ruins.

From Ardahán the road lies over a high table-land, abounding in excellent pastures intersected by swamps, but with very little cultivation. In a distance of about 25 miles, not a single village occurred, nor until within three hours of Kárs did villages and cultivation reappear, when the country became well peopled and highly productive.

Kárs was formerly a large town, and might have contained 6000 or 8000 families; a part of it is walled and has a citadel*, but it is commanded by heights within musket range, on the opposite side of a deep narrow ravine, through which runs the river Arpah-Cháï.† Two stone bridges unite the two portions of the city divided by the river, encircling the walled portion of the town on three sides.

The town is now little better than a heap of ruins, not containing above 1500 or 2000 families. A great part of the Turkish population abandoned it during the Russian occupation, and all the Armenians emigrated with the retreating army of the Russians, leaving many deserted villages, and a great deal of unoccupied land. The Turks of Kárs have always been considered a turbulent and bad race of people, but the Páshá has succeeded in gaining an ascendancy over them, and they dare no longer show their seditious spirit. Kárs is the residence of a Páshá of two tails.

The climate is very severe, but the fertile plains around produce abundant crops of excellent wheat and various grains, the surplus of which is exported to Georgia. Wheat produces six to eight fold, and barley eight to ten.

On quitting Kárs, I proceeded through a rich and well-watered plain, about twenty-five miles in extent, with luxuriant pastures, abundance of cultivated land and numerous villages; among which, one only is inhabited by Armenians, all the others being possessed by Turks. There were numerous herds of remarkably large and fine cattle. From the extremity of the plain, I commenced, by a very gradual rise, the ascent of the Suvánlí Dágh, which is covered with forests of Scotch fir. It would be easy to make a carriage road across this mountain range, which is traversed during the summer by carts, used for the transport of goods be-

* Built by Amurath (Murád) III.—Ed. † Barley-river.

tween Kárṣ and Erz-rúm. The ascent is long and gradual, and the estimated height may be 5500 feet above the sea; the descent is short and rapid, and ends on the banks of the Aras, flowing through the plain of Pásín, which is remarkable for its fertility; wheat was said to return ten, and barley fifteen fold. Innumerable Armenian families emigrated from Pásín with the Russian army; most of the villages are but half inhabited, and wide tracts of rich land lie waste. This plain is separated from that of Erz-rúm by a low range of hills *, rising from 800 to 1000 feet above the plain, called the Deveh Bóyiní, or Camel's Neck.

Hasan Kal'eh, the town of the plain, has been a considerable place, but it is now a heap of ruins, and contains only some 30 or 40 families; it is walled, and has a Genoese castle in ruins, but it could not be made defensible, on account of the vicinity of the mountains. The distance from Kárṣ to Erz-rúm is about 110 miles. The forests of the Suvánlí Dágh supply Kárṣ, Erz-rúm, and the villages in the plain of Pásín, with timber for building and firewood. A few Kurds inhabit the plain, who do not migrate beyond it, and are quite inoffensive.

Erz-rúm † must always be of importance from its position. It is situated in an extensive and fertile plain between 30 and 40 miles in its extreme length, and from 15 to 20 in its greatest breadth, watered by the Kará Sú, or western branch of the Euphrates. On every side are found rich grain-countries in which good horses, fine mules, cattle and sheep, are reared in great numbers. Erz-rúm commands the road to Persia, protects the approach to Constantinople, and is now the first important place in Turkey, whether entered from Georgia or Persia. As a Páshálik it yields only in rank and extent to that of Baghdád.

The climate is severe on account of the elevation above the sea, which I estimate ‡ at 5500 feet. The plain formerly contained about 100 well populated and flourishing villages, some partially and some wholly Armenian; the latter people have chiefly emigrated, and, in consequence, there are many villages half inhabited, many without inhabitants, and a great portion of the plain lies waste. The soil is of unequal fertility; towards the upper part, near the mountains, where the town is placed, wheat yields

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* One of the highest points of Armenia, and forming the separation of the waters of the Araxes and Euphrates, whose sources here approach within 10 miles of each other.—Ed.

† Arze, the antient name. Arze-el-Rúm, contracted into Arzerúm. Anatolia is called Rúm by the people to the eastward. To this day, you are asked in Persia whether you come from Rúm.

‡ By a series of Barometrical Observations. A. As at Erz-Rúm water boils at 200° of Fahrenheit's scale, the level of that place appears to be about 7000 feet above the sea. See Memoir of Mr. G. W. Brown, in Walpole's Memoirs, relating to Greece and Asiatic Turkey, vol. ii. p. 178.—F. S.

only six to eight fold, while in the lower ground, near the river, it renders twelve to fifteen fold. All the grains in this part of Armenia are reckoned peculiarly fine in quality.

The city is rising slowly from the ruin in which it was involved by the Russian occupation, and by the emigration of so many industrious and laborious Armenians; its former population was estimated, in 1827, at about 130,000 inhabitants; at present there cannot be above 15,000, but it fluctuates considerably, on account of the vast number of strangers who are constantly arriving and departing with caravans. The town is partly surrounded by an old castellated wall, of the date of the Genoese occupation, and contains a citadel. A large portion of the city is unwalled, where are the principal bázárs and kháns.

On leaving Erz-rúm on the 2nd of July I crossed the plain, following the course of the Kará Sú for about 20 miles, and then diverged from the high Constantinople road, which continues near the river, and went over a more elevated tract of country, with little cultivation and few villages. It is in ordinary seasons deficient in moisture, and hence crops are then scanty; but in wet seasons it produces a good return. From this elevated ground I descended into the plain of Terján, in which the Mamah-khátún river unites with the Kará Sú. This is a fine plain and well watered; the district contains about 40 villages, inhabited by Turks, among whom a few Armenians are intermingled; but it is susceptible of maintaining more people, for a great deal of fine land lies waste. The people complained much of the predatory conduct of the Kurds who live in the Dújik mountains, which border the plain on the south, to whom they attributed the desolate state of the country. No cattle can be left out at night; all grain reaped must be housed before night, for both cattle and grain found in the fields are carried away by the Kurds.

The climate is much milder than at Erz-rúm, as was indicated by the state of the harvest; here the grain had turned yellow, while at Erz-rúm it had not come to a head: wheat returns here ten fold. The buildings are half underground, in the usual Armenian style; but the winter is not severe enough to prevent the cattle being sent out to feed. The Kará Sú, after the junction of the Mamah-khátún river, becomes a considerable stream, and even in the driest season is fordable only in a few places.

The distance from Erz-rúm to Karghán may be about 60 miles in a west-south-west direction.

Between the plains of Terján and Erzingán, a mountain-range intervenes with many very strong passes easily defensible; it is inhabited by Kurds, and forms part of the Dújik range. The river makes a circuit far into the mountains; its channel was said to be

full of rocks and rapids; it rejoined our road as we entered the plain of Erzingán.

The Dújik mountains are peopled solely by Kurds, who inhabit villages in winter and cultivate the land. They are represented as rich, pay no sort of contributions to the Sultán, lose no opportunity of levying them on passengers whom they meet, and are in the constant habit of plundering their neighbours. There are two powerful tribes, one called the Sháh Huseïn, and the other the Balabánlí; each, I was informed, could bring between 4000 and 5000 men into the field, mostly on foot. Several other tribes inhabit these mountains, of which I could not get any particular account, as they reside on the southern parts of the range. The distance from Karghán to Erzingán I estimated at about 30 miles, in a direction inclining a little to the southward of west.

Erzingán is a town containing about 3000 houses or families, of which about 800 are Armenian and the rest Turkish; it is governed by a Bey, and is a dependence on the Páshálik of Erz-rúm. The houses here, and in all the villages of the plain, are built above-ground, which gives them a more agreeable and cheerful appearance than in other parts of Armenia. The town is situated at the western end of a beautiful and rich plain, which is about 20 miles long, by 7 or 8 broad. The Gújik mountains form its southern boundary, and at their foot runs the Kará Sú.

The climate is here never severe in winter and it is warm in summer. The harvest was ready (6th July) for the sickle, and the season was rather more backward than usual. On the northern side of the plain the bases of the mountains bounding it are covered with villages, surrounded by very extensive gardens, which furnish, in great abundance, excellent fruit to the circumjacent districts, even as far as Erz-rúm, Báïbút, and Gúmish-khánah. Grapes and melons are among the fruits produced. The fields bore the most abundant crops I had anywhere witnessed; the wheat was heavy and the straw much longer than in the Erz-rúm plain. Wheat was said to render twelve fold. The centre of the plain was rather swampy, and showed indications of salt. It affords pasture to a great number of mares, cows, and sheep. There were stated to be about 100 villages in the plain, but the Kurdish depredations have been gradually diminishing the number of the inhabitants. A village I stopped at, formerly contained 100 families which had now only about thirty, and I was informed that most of the villages were similarly reduced. In no part of Asia Minor did I see a plain with a more luxuriant vegetation, nor with the appearance of a more careful cultivation.

Crossing the plain in a southerly direction, in about an hour and

a half, we entered a very narrow defile through which the Kará Ṣú flows. This defile in its whole length to Kemákh is very strong, and presents innumerable defensible positions. The river was on my left running at the foot of the Dújik mountains, on my right were mountains all but precipitous. The river is fordable in one or two places with some difficulty, during the dry season. It took me ten hours to go from Erzingán to Kemákh, but from the nature of the road I should not conceive the distance to be above twenty-six miles. I entered Kemákh by a bridge of wood thrown over a deep chasm in the mountain through which the river has forced its way. Just before entering the chasm, the Keumer Ṣú had joined the Kará Ṣú: the former comes from the mountains in a westerly direction, and by it wood is brought down for the use of Egín and Kebán Ma'den, and floated down thither by the Kará Ṣú.

Kemákh is a singular place; an elevated portion of the town is within a wall of very ancient structure, but commanded by mountains rising close to it. The remainder is situated on a slope amidst gardens ascending from the river's banks. The governor is one of the remaining Dereh-Beys,* whose family has held the office for several generations, and who possesses extensive tracts of land around. The town contains 400 Turkish and about 30 Armenian houses: there seemed to be no commerce nor manufacture. The inhabitants live by cultivating the neighbouring valleys and by transporting wood to Kebán Ma'den. There is sufficient water in most parts of the river to navigate it with boats, but rapids, rocks, and shoals too frequently occur to render the clearing the channel a promising enterprise in the present state of the country; I was informed, however, by a person in the habit of bringing down timber from Kemákh to Egin, that the difficulties opposed to such an undertaking were by no means insuperable.

On quitting Kemákh I recrossed the bridge by which I had entered it, and took a course more westerly than the river, crossing mountains which here and there presented strong positions. The post-station was formerly near the river, but it had been removed several hours from its banks, which lengthened our road. I reached Herbemeh, the post, a small village, after a ten hours' ride, but I did not estimate the distance above twenty-five miles. From that village I returned towards the river, and reached the ferry of Khóstú in four hours or twelve miles, having passed in the way the village of Ḥasan O'vah,† situated in a very productive valley. The river at the ferry of Khóstú was rapid and wide, and not fordable. I saw on the left bank some women reaping the

* Valley-beys, or chiefs. † Hasan's plain.

corn, and armed men watching near, to prevent the Kurds from carrying it off. After crossing to the left bank of the river I continued along it for about three miles, till I reached a village below which the stream again enters a vast rent in the mountains, the precipices on either side rising to 1000 or 1500 feet. I here quitted the river and crossed the range to shorten the road ; the river soon after passing through the chasm in the chain makes a bend to the south-east, and our course cut off this corner ; the mountains were very steep. There was said to be a better, though a longer, road by keeping along the right bank of the river, but it could only be better by comparison—good it could not be. The distance from Herhemeh to Egín I estimated at about thirty miles on a general bearing of south by west, but the nature of the road made the day severe for the horses and tedious for the riders, having been about thirteen hours on the road.

Egín is situated in a very deep valley on the right bank of the Euphrates ; the approaches to it are difficult on every side, we crossed the river by a long wooden bridge to reach the town, as the road we took was on the opposite bank. There are numerous villages in the valley, nearly as populous as the town itself. The mountains rise from the banks of the river by a steep slope, which is terminated by abrupt precipices ; the whole height of the mountains may be about 4000 feet, and the valley is so narrow that they seem quite to hang over the town. The sloping part of the mountains is covered with gardens, on terraces rising one above the other, and the trees being thick the houses appear to be situated in a forest, and the contrast between the lower part of the valley and the severe and lofty limestone precipices which border it produces a singular effect ; in fact I never saw so remarkable a valley. The climate is very temperate, agreeably cool in summer from the abundance of trees and water, and the current of air which blows through the valley ; and in winter snow seldom lies on the ground, but the higher mountains are then impassable, and it often happens that all communication is, for weeks together, cut off between the valley and places beyond the mountains. The town contains 2700 houses, 2000 of which are Mohammedan and 700 Armenian. Many of the villages contain 400 or 500 houses. Very little grain is cultivated in the valley, from the want of level ground, and the whole is occupied by gardens. The trees are mostly the white mulberry, the fruit of which is eaten fresh ; it is also dried, and then converted into brandy, or boiled into petmez, a syrup obtained likewise from grapes. Wine is made in small quantities, and common fruits are abundant. The *goître* is a frequent disease, and I found a man who said it was hereditary in his family, his mother had it, and all her children, while the children of his father by another wife were exempt from it.

After quitting Egín, we continued on the western bank of the river, but instead of following the windings of the stream we crossed several steep mountains and deep valleys. The road is less difficult than that by which I approached Egín. The course of the river was more or less obstructed by rocks and shoals, and it is not used as a channel of communication, except for rafts of timber for the use of the mine at Kebán Ma'den. After continuing with the river for about fifteen or sixteen miles, we left it, and turning more westerly crossed a mountain range, which brought us by a slight descent to an elevated plateau on which 'Arabgír is situated. The distance from Egín to 'Arabgír may be about thirty miles in a direction first south and then south-west. There was stated to be a better road from Hasan O'vah, avoiding Egín and keeping at a distance from the river.

'*Arabgír* is fifteen caravan days (about 270 miles) from Aleppo, and only eleven (198 miles) from Trebizond; the route to Trebizond is the more secure. The climate of 'Arabgír is severe on account of its elevation, and much snow falls in winter. The summers are cool; the harvest was reaping (12th July).* The land about 'Arabgír is good, and wheat was said to yield twelve fold, but on account of there being so much rocky ground producing little or nothing, the quantity of grain grown is not more than sufficient for the consumption of the inhabitants. The town is situated in the midst of a forest of fruit-trees, among which the white mulberry is the most common, the fruit being eaten, as at Egín, and used for making brandy or petmez.† There are about 6000 houses, 4800 are Mohammedans and 1200 Armenians. The latter are principally engaged in manufacturing cotton goods from British yarn. The manufacture, which has been introduced of late years only, has extended itself rapidly, and there are now nearly 1000 looms at work. The place is in a thriving condition in consequence, and is one of the most interesting towns in the interior as regards Trebizond.

In the district of Dívrígí, to the north, on the road from Hasan O'vah, there are iron mines, which are not regularly worked, but those who choose are at liberty to extract ore; it is not done on any important scale. At a place called Zeïtún on the road to Aleppo, I was informed that there were also iron mines regularly worked, which supplied the surrounding country with metal of an excellent quality.

The road from 'Arabgír to Kebán Ma'den lies over an un-

* Exactly two months later than the beginning of the barley harvest at Smyrna, only 37 or 38 miles south of 'Arabgér.—F. S.

† Petmez (properly pekméz) is inspissated grape-juice, a common sweetmeat in the Levant.—F. S.

dulating, open, barren, and uncultivated country, affording only a scanty herbage to a few cattle and sheep. Between 'Arabgír and the Euphrates, a distance of about twenty miles, I passed but one village, with a little cultivation around it. Before reaching the river I fell into the military road, constructed from Ṣámṣún by order of Reshíd Mohammed Páshá: it appeared to have been made with too great haste and too little labour to promise durability. I crossed the Euphrates by a ferry; there are three boats clumsily constructed but adroitly managed. The stream here is about 120 yards wide, deep and rapid. Two hours above this ferry, the Kará Sú, or Western Euphrates, which rises near Erẓ-rúm, is joined by the Murád Cháï, or eastern Euphrates, whose sources are in the neighbourhood of Diyádín. The united streams preserve the name of the Murád Cháï* as far as Bír, where the river finally assumes that of Frát.†

The town and mine of *Kebán Ma'den*‡ are situated in a ravine about half an hour from the ferry; a small stream runs through the valley and joins the Murád Cháï, a short distance below the ferry. The town evidently owes its existence to the mine, for there would appear to be no other possible inducement to have fixed it in such a situation. The mountains around exhibit barrenness under its most forbidding aspect, for they produce neither tree nor shrub, nor vegetation of any kind. The ravine is so narrow that there is no space for cultivation, as the mountains unite in it at an acute angle. The climate is extremely hot in summer, and from the elevation of the mountains, a good deal of snow falls in the winter. The town contains about 400 or 500 families, all more or less employed in the working and superintending the mine, or in supplying the wants of the miners and their families. The greater number are Greeks, natives of the mountains, between Gúmish-khánah and Trebizond, but there are likewise some Armenians and Turks. The latter are generally the directors of the various departments; the Armenians are artisans, and the Greeks are the miners. There is no trade in the place excepting for the consumption of the inhabitants. The mine is of argentiferous lead, and would appear to be a very unprofitable concern, at least in the hands of the government.

We left Kebán Ma'den by ascending the ravine in which it is situated, and after riding nine miles, emerged from it and came to a more open and productive country, but still mountainous, crossing which for about ten miles more we descended to a magnificent and well cultivated plain, studded with villages. This plain is extensive; it might perhaps be ten or twelve miles long by

* Murád's river, or the wished-for river. † Properly Forát.
‡ Mine of the gorge or pass; Balance-mine.

about six broad, but we crossed it only in its breadth. A low range of mountains separates this plain from the adjoining one of Kharpút. The distance from Kebán Ma'den to the town of Kharpút I estimate at thirty miles, over a good road, direction about south-east.

Kharpút is placed on an eminence at the termination of a range of mountains, but higher parts of the range command it, so that it cannot be regarded as a strong military position. • The city overlooks an extensive, beautiful, and productive plain, and was said to contain 1720 families, 1400 Turkish, 300 Armenian, and 20 Catholic; but since it has been the head-quarters of Reshíd Mohammed Páshá, the population must, at the present moment, be much greater. The plain furnishes a vast quantity of grain; its length may be estimated at not less than thirty-six miles; in general it is not above four to six miles broad, but in some parts it expands more; it is of unequal fertility, the centre being well-watered by numerous small streams, is most productive, while near the foot of the mountains on the sloping edges of the plain the land is arid and stony. Wheat returns twelve to sixteen fold. The climate is temperate, being neither excessively warm in summer, nor extremely cold in winter; the productions of the soil are various, consisting of every kind of grain, grapes, wine of a superior quality, oil from seeds, and cotton. The streams of the plain flow eastward until they fall into the Murád Cháï, which skirting the eastern extremity of the plain, joins the Kará Sú two hours above the ferry of Kebán Ma'den.

I was surprised to learn that in this plain the population was generally redundant, a fact I never heard asserted elsewhere in Turkey. At an Armenian village where I lodged, containing eighty families, I was informed that only sixteen had lands, the remainder acted as labourers, and when no employment could be obtained they migrated to the capital or some large city to procure work, leaving their families (as hostages for their return) in penury, if not a burden, to the richer classes. Yet these people are not allowed to remove with their families to parts of the country where inhabitants are thin and spare lands abound. The prohibition to removal is enforced only against Christians, I believe, and it is intended to prevent migration and the diminution of contributors to local taxation, for the head of the family is called upon to pay his portion at the place where his family resides, notwithstanding his necessities oblige him to seek employment elsewhere.

Taken as a whole I had not seen any place, with the exception of Erzingán, approach to the state of apparent prosperity enjoyed by the inhabitants of the plain of Kharpút.*

* It may be interesting to know something regarding the condition of the agricultural population, and I will state what I learned from an Armenian farmer in the plain of Kharpút. He had ten pair of draught oxen, a few cows and sheep. The

Descending from the eminence on which the town of Kharpút is situated, we crossed the plain, in an oblique direction, and ascended a very steep mountain, on the face of which the military road has been continued, but the passage is still very difficult, on account of the extreme rapidity of the ascent, which it took us two hours to accomplish. In another hour we descended to a lake called Geuljik, * which has been generally described as salt, but having tasted the water I can affirm that it is fresh; the lake is about twelve miles long and three or four broad. From thence we passed along a tolerably well cultivated valley to a Kurd village situated at its extremity. The inhabitants appeared to be rich in cattle and ought to be at their ease, from the excellent land under cultivation. We then crossed a beautiful but small plain with two villages in it, and soon engaged in a succession of very difficult mountain passes; here all traces of the military road are lost. In these barren mountains are situated the sources of the Tigris and the copper mine of Arghaná.† There are collected around the latter about 743 families, 270 Greek, 173 Armenian, and 300

The produce was—

Wheat, 375 bushels, valued at 4*s*.	£75
Millet, 50 ,, ,, 1*s*. $2\frac{3}{4}$*d*.	3
Cotton, 1155 lbs. ,, 6*d*.	28
Grapes, 3300 lbs. ,, $\frac{4}{10}$*d*.	6
Sundries, as lentils, beans, seed for oil, butter, &c. all used in the family or consumed by guests	30
	£142

The Expenditure—

125 bushels of wheat furnished to the mines	£25
200 bushels furnished to guests	40
495 lbs. of cotton paid to the lord of the Soil	12
Tax to the Páshá, ten per cent.	14
	£91
Remains for the maintenance of the farmer and his family	51
	£142

The 50 bushels of millet and 50 bushels of wheat, the grapes and the sundry produce, were consumed by the farmer and his family. The cotton sold, after the lord of the soil had taken his rent, was about sufficient to pay the tax to the Páshá. The man received occasionally something from his guests, which, as it would be paid in money, was probably saved; but this was the statement made by the farmer, and as is universally the case, he no doubt represented his position rather worse than it really was. Nearly two-thirds of the whole produce was thus consumed in rent, taxes, and entertainment of strangers. I was not informed how much land he had in cultivation; there is no measure of land, it is estimated by the quantity of seed used in sowing, or the number of oxen necessary to plough it. They do not manure much, but allow the land to lie fallow every alternate year. Such is the general system of agriculture throughout Armenia.

* Little Lake, also called *Geukcheh, i.e.* "sky-blue." St. Martin Mém. sur l'Arménie, vol. i. p. 64.—F. S.

† Or Arghaní, from the Armenian Arghni or Argni. They also form the ridge running in a north-east and south-west direction, between the tributaries to the Euphrates on the west, and the waters of the Tigris on the east, which are here only separated by a distance of about ten miles.—Ed.

Turkish. The first and last are all engaged in directing or working the mines, the Armenians are tradesmen or artisans. From the mine to the town, a distance of about ten miles, in a direction to the eastward of south the road lies over steep, difficult, and barren mountains.

Arghaná is situated under a lofty peak (surmounted by a large Armenian convent) overlooking a vast plain, part of the Arabian desert; it contains about 600 families, one-half Mohammedan and the other Armenian, and appeared in a very dilapidated state. The elevated position of the town gives it the advantage of a cool breeze, while in the plain below the heat is inconvenient. The slope from the town to the plain was occupied by fields and gardens, producing every sort of grain, cotton, fruits, and a very superior wine; the land was stated to be very rich, and wheat to return sixteen fold.

From Arghaná to Diyár-bekr,* we passed over a vast level intersected by a low ridge of limestone hills; but did not see a single village in the whole route, a distance of about 36 miles. We passed, however, some fields of wheat and millet, said to belong to Kurds whose encampment was a little out of the road; the crops appeared very light. We saw only one rill of muddy-water, but was told that excellent water is found by sinking wells to a moderate depth in any part of the plain.

The distance from Kharpút to Diyár-bekr may be estimated at 55 miles in direction about south-east.

Diyár-bekr† is situated on the right bank of the Tigris, and between the river and the town gardens intervene. The area of the city is very considerable, the walls are lofty and substantial, they are constructed of the ruins of more ancient edifices, and surmounted by a castellated parapet to protect musketeers, but they have evidently been built before the use of cannon.

The town in its prosperity contained 40,000 families or houses, and numberless looms in constant work; it enjoyed an active trade with Baghdád in Indian, and with Aleppo in European produce, and was one of the most flourishing and wealthy cities of Asia. The plain was cultivated in every part and covered with villages, and within 3 miles of the gates there were several villages, each containing from 400 to 500 houses, and more than one Christian church.

At present, the number of houses or families in the city is

* Diyár-Bekr (the tents or dwellings of Bekr), pronounced by the Turks Diyár Bekir, derives its name from Bekr, son of Wáyil, a great-grandson of Rabí'ah, from whom the adjoining division of Al-jezírah (the Peninsula) was named. They all descended through 'Adnán from Ishmael. Pocock's Spec. Hist. Arab. p. 45. Jihán numá, p. 436.

† The Ancient Amida.—Ed.

reduced to about 8000, (of which 1500 are Armenian, 85 Catholic, 70 Greek, 50 Jews, and 6300 Turkish); there exist but a few hundred looms, half employed; the trade with Baghdád is annihilated, and that with Aleppo is reduced to insignificance; there are but few merchants and those not wealthy, the people are distressed and without occupation, not a village remains in the whole plain, not a person dares reside without the walls, and the plain is very imperfectly cultivated by Kurds. Until Reshíd Mohammed Páshá established his authority at Diyár-bekr, the inhabitants were almost in a state of siege, for no one dared to venture without the city, except in company of a caravan, and the communication with Baghdád even by a Tátár was cut off. All this desolation and depopulation was produced by the Kurds, and that too, in the memory of my informant, within 25 years.

The climate, though excessively hot in summer, cannot be considered unhealthy, and in winter the temperature is delightful. I was informed that in the plain wheat would yield a return of 16 fold, and that the scantiness of the crops I had observed was the consequence of great economy in the seed and the negligent mode of cultivation in use by the Kurds.

The situation of Diyárbekr is admirably calculated for that of a great commercial city, and nothing appears necessary to revive its antient importance, but a removal of the causes which have occasioned its decline, namely, insecurity and the interruption of its communications with Baghdád.

The Tigris is not used as a channel of transport so high up as Diyár-bekr, but rafts of timber are sometimes floated down from the mountains above the town.

From Diyár-bekr we returned to Kharpút, and thence took the road to Malatíyah. After reaching the extremity of the plain of Kharpút, we crossed a lofty range of mountains covered with small oak trees producing a considerable quantity of gall-nuts, and descended to the banks of the Murád Cháï, where the ruins of a mosque and large cárávanseráï exist. From Kharpút to the river is about 30 miles. Half a mile below the caravanserai, the Euphrates has cut a passage through the main chain of Taurus; whence it continues about 45 miles among the mountains, its course interrupted by rapids and rocks; lofty precipices rising on either side to a very great height. This part of the stream is never passed by rafts of any kind, but when it emerges from the defile it then becomes navigable without any further interruption.

From the ruined cáravánseráï we ascended the river for about four miles and crossed it at a ferry called Eiz Oghlú,* from the

* Eyás Oghlú?—F. S.

name of the district. On either bank is a village, both together containing a hundred Kurd families. The inhabitants were apparently poor, and we could scarcely procure any food, but in the evening we saw many cattle returning from the pastures.

*Aspúzí** is about 21 miles, in a westerly direction from the Euphrates; it is situated amidst a forest of fruit trees on the side of a mountain, six miles above the town of Malatíyah, the inhabitants of which remove to Aspúzí for seven months, returning for the five winter months to Malatíyah: during the summer months, Malatíyah is abandoned to a few persons left to guard the houses, every other inhabitant quitting it. It is singular to see the population of the city transferred, for a portion of the year, to another close by; and no inconvenience in the position of Malatíyah would seem to have forced on the people this extraordinary custom.

Malatíyah and Aspúzí, which may be considered as one town, contain 3923 families—2800 of which are Turkish, and 1123 Armenian. Plague, cholera, and Kurdish depredations have been gradually causing a diminution of the population; and the extensive and fertile plain of Malatíyah is nearly reduced to an uncultivated waste.

Malatíyah, as we saw it, deprived of its inhabitants, was the most desolate-looking place that can be well imagined. Not a living creature was to be met, and the streets were overgrown with grass.

The ancient walls are in ruins, and in most parts have fallen down; the houses have a mean appearance; the shops in the bázár are mere mud-stalls. I saw two well-built mosques and two caravanserais, all in the Persian style of architecture. I passed through the city, and on leaving it by a handsome gate I observed the people appointed as guards of the houses, whose appearance did but augment the melancholy impression the situation of the city had excited.

From the city, we traversed the plain down to the Tokhmah Ṣú, we crossed by a bridge,† three or four miles below which the river falls into the Murád Cháï. A causeway on arches is united to either end of the bridge, extending across the valley in which the stream flows, and indicating an occasional great rise of the river. About seven miles from the Tokhmah Ṣú,‡ we came to another stream, named the Chámúrlú Ṣú,§ flowing through a deep narrow valley, well cultivated and irrigated by the waters of

* Aspúzí is on the bank of the Deïr Mesíh (Christ-convent), a small stream which joins another called Bunar-báshí (spring head) in the town of Malatíyah.—F. S.
† Called Kírk-genz, "Forty-eyes." Jih. Numá, p. 600.
‡ Boundary water.
§ Mud-water.

the river; it also falls in the Murád Cháï. I passed in the plain a column of stone, which marks the half-distance between Constantinople and Baghdád. There was likewise in the plain a ruined Khán.

*Hasan Batrík** is a village situated at the extremity of the plain, which, in a north westerly direction, is about sixteen miles broad; the length of the plain which accompanies the course of the Tokhmah Sú, flowing about east and west, must be very considerable. Hasan Batrík contains fifty Mohammedan families. Here are the ruins of a handsome mosque and caravanserai, built of freestone in the Persian style of architecture.

The plain, except in the valleys of the river, was a waste, and yet there could be no other reason for its being so, but the insecurity of the country. The fields around the village seemed productive in grain, and some cotton is grown.

Immediately on quitting Hasan Batrík, I entered a defile, in which runs the Chámúrlú Sú. The mountains are lofty, but not very steep, they are covered with small oak bushes; the valley is narrow. I crossed the stream at about fifteen miles, and after ascending a very steep and high mountain came to Hákim Khán, situated a short way down the opposite side. The distance from Hasan Batrík to Hákim Khán, I estimate at about eighteen or twenty miles; the road mountainous but not difficult: at the place where we forded the river, the water was girth deep; in the spring it is both difficult and dangerous to cross, and it is seldom that any persons but Tátárs make the attempt. The total distance from Malatíyah to Hákim Khán is about thirty-six miles, on a general bearing of north-west.

Hákim Khán is a small and apparently poor town, it contains about 250 Turkish, and 35 Armenian families. There is an old castle; and a Khán in the Persian style, said to have been built by a doctor, and hence its name. The country around is mountainous and arid, the rocks are all limestone. Vines do not thrive, on account of the severity of the winter; a small quantity of hardy fruits and tobacco is grown. Wheat yields six to eight fold.

Thus far from Diyár-bekr I had followed the high Constantinople-road, which continues onwards in the same north-west direction, while I took a more westerly course to Ghurun. Leaving Hákim Khán, we crossed mountains, valleys, and streams, without following any beaten track, and finally came again to the Tokhmah Sú, which we had quitted near Malatíyah, having made a circuit of the Agjí Dágh † mountains. I followed the course of the Tokhmah Sú, in a northerly direction for about five miles, till I arrived at Ghurun, a little above which town the principal branch of this river has its source.

* Patriarch Hasan. † Hájí Tágh? Tágh is commonly pronounced Dágh.

The distance from Hákim Khán to Ghurun I reckoned forty-five miles, on a general bearing of west.

Ghurun is situated in a deep narrow valley, whose eastern side rises in a precipice, the western slopes, and is cultivated where the ground permits. A stream runs through the valley, which is filled along both its banks with trees and gardens, amidst which the principal part of the houses are situated. The town contains 850 Turkish, 860 Armenian, and 63 Catholic Armenian families; the only instance of a town in the interior, in which the Christian exceeds the Mohammedan population. The winter is severe, the summer short, and the cultivation of the soil would not appear to be a favourite or profitable pursuit. The inhabitants indiscriminately are engaged in a trade with the migratory tribes of Turkomans and Kurds, who, in their migrations from near Angora, where they winter, pass several weeks in pastures around Ghurun, at distances of from six to eighteen hours. The traders of the town supply all the wants of these migratory tribes, and receive in payment the produce of their flocks and herds, which they either use, re-export, re-sell on the spot, or manufacture. The principal article is sheep's wool, of which a large quantity is bought and sold here.

From Ghurun I ascended the steep eastern side of the valley, and travelled over a mountainous tract, the hollows of which abound in fine pastures, the summits being bare limestone. These pastures are said to extend to the neighbourhood of Kaïsariyyeh.* In spring they are luxuriant, but they were now dried up, having been in the early part of the year fed down by the herds and flocks of the Kurds.

Manjelik, at 25 miles from Ghurun, in a northerly direction, is a small village, and the only one on the road; it formerly contained above 100 families, but all the Turks abandoned it from the depredations of the Kurds, and 15 Armenian families only now remain, induced to do so by the presence of a very ancient church dedicated to Saint Thórós, which is a place of pilgrimage and of peculiar sanctity. Here is much more land than the inhabitants have the power to cultivate, and they occupy only the best, and that nearest the village, which is situated in a valley watered by a small rivulet, and the land appeared good; wheat yields ten to twelve fold. The climate is extremely rigorous in winter, and a great deal of snow falls, the summers are short and not warm, though the grain produced is very fine; the peasants are well supplied with butter from their herds, and wool from their flocks, but their

* Kaïsar, for Kaïsariyyeh, is only used by the common people.

butter and grain are mostly consumed by guests, who frequently do not pay for their entertainment. I lodged in a house belonging to four brothers, all of whom had received five wounds each, in defending themselves and their property against Kurdish aggression. Páshás and Ághás did not vex them much, because the village is the only one between U'lásh and Ghurun, a distance of 54 miles, which would be totally impassable in winter for caravans without the shelter afforded here; and a fear of the inhabitants abandoning a post so essential to the communications, prevented their experiencing the usual quantum of vexation and spoliation.

From Manjelik to U'lásh, a distance of about thirty miles on a a general bearing of north by west, the same sort of pastures are to be found as described from Ghurun to Manjelik, without however a single village; but there did not appear to me any other impediment to both villages and cultivation than the depredations of the Kurds.

U'lásh is inhabited solely by Armenians, and contains sixty families. It stands about eighteen miles south-west of Sívás. The soil is deep and rich, wheat yielding ten to twelve fold. In a hollow in the plain, which is filled to the depth of a foot or two with water in winter, but was now dry, were incrustations of salt. The people appeared to be very much at ease in their circumstances.

On the road from hence to Sívás there are two large salt-works: the salt is procured from springs; the surrounding country is supplied from them, and the government is said to derive considerable revenue from the works, which belong to it. The country from U'lásh till I reached the plain of Sívás was mountainous, not entirely without cultivation, but I did not pass any village.

Sívás,* situated in a plain from four to six miles in breadth by perhaps sixteen to twenty in length, is remarkable for producing good crops of grain of a very superior quality. The plain is watered by the Kizil Irmák,† which though not remote from its sources, is here a considerable stream, and within a distance of five or six miles has two broad stone bridges over it. Timber for building and fuel is brought down by it, from the forests in the mountains in which the river rises. The climate is severe though remarkably healthy.

The town covers a large area, but within it are many ruins; it contains about 5000 Turkish and 1200 Armenian families.

Many of the old mosques and kháns prove the town to have been once under Persian dominion.

* Sívás is on the site of the ancient Sebaste, and is capital of the Páshálik (Eyálet) of the same name.—Ed. In Armenian Sepasdia, Sevasdia, and vulgarly *Sevasd*.

† Red River (Halys).

The position of Sívás is a very excellent one for an important commercial city. The access to it from the Black Sea is easy, and has been facilitated by the military road made by Reshíd Mohammed Páshá. It is situated in the centre of a district abounding in the first necessaries of life, and of a country which would require extensive supplies. The route by Sívás is certainly the best to reach Malátíyah, Kharpút, and Diar-bekr, and I may add Baghdád.

The bázárs are extensive and the kháns numerous, both being well supplied with goods.

From Sívás, after quitting the plain, the road crosses a country abounding in extensive plains, separated by ranges of mountains generally of a low elevation. The distance to Ḳaïsariyyeh is about eighty-four miles in a direction nearly south-west. The plains are well cultivated and the country better peopled than most other parts; the soil is fertile, and wheat yields a return of from ten to sixteen fold.

I reached Ḳaïsariyyeh two days after it had been visited by an earthquake, and I found it nearly deserted. The inhabitants had taken refuge in the villages, or were outside the town under tents. It was fortunate that the calamity occurred at a period of the year when so many of the inhabitants reside in the country, or the loss of life would have been more considerable. About 150 persons were killed in the town, and it was calculated that in the villages about 400 perished. Many houses were shaken down, and scarcely one escaped damage.

Ḳaïsariyyeh, the ancient Cæsarea,* is situated at the foot of the mighty and constantly snow-capped Mount Erjísh (Argæus) rising probably to the height of 10,000 feet above the sea;† the ruins of a more ancient town are close by, which was destroyed by an earthquake. The city is surrounded by a wall quite dilapidated, and has a castle within, on the same level as the city; neither could offer any resistance to cannon. In the environs, as well as within the town, there are many buildings which bear evidence of a Persian occupation.

The climate is warm in summer and not severe in winter, yet it is not reckoned very healthy. There are to be found here the

* Capital of Ancient Cappadocia, and then called Mazaca; afterwards changed to Cæsarea, in the time of Tiberius.—Ed. In Armenian, Mazhag or Mishag, from its founder Meshag.

† In the year 1834, a gentleman from the United States, travelling in this country, ascended Mount Erjísh; he was accompanied by guides, and they reached the summit in safety. In descending, the traveller, against the advice of his guides, took what appeared to him a shorter path; the rest of the party followed the track of their ascent. The unfortunate gentleman fell, and was so severely hurt, that, although his comrades conducted him alive to the village where he resided, he soon died of the injuries he had received.

productions of a warm climate, as melons, figs, pomegranates, grapes, &c. The plain did not strike me as either fertile or well cultivated, except just around the town. The base of the mountain is covered with gardens, which produce fruits and the yellow berry* used in dyeing, for which Kaïsariyyeh is so celebrated.

The mountain supplies timber for building, firewood and charcoal, all which are reasonable in price. The town contains 8000 houses—5000 Turkish, 2500 Armenian, and 500 Greek. The villages in the neighbourhood are large and populous, and the Christian inhabitants display their riches and luxury in their country residences more than in any other part of Turkey.

This is the principal commercial mart in the central part of Asia Minor; its natives are remarkable for their enterprise and activity, and they are found assiduously following their pursuits in the remotest corner of the empire. Of late years the importance of the place has very much declined, owing to the insecurity of the country on account of the Kurds.

The central part of Asia Minor is generally deficient in wood, for except in some of the recesses of the mountains, where scattered forests may be found, scarce a tree is to be seen throughout the country. Dried cowdung is the fuel principally used in cities by the poorer classes, and universally so by the villagers.

Throughout Asia Minor it is very usual to find rye growing among wheat, but I never saw a whole field of rye.

The distance from Kaïsariyyeh to Yúzgát† I reckon about 96 miles on a general bearing of north by west. The country is neither fertile, populous, nor well cultivated, but there are parts in which both villages and cultivation are found, and without doubt this would be the case more generally, were it not for the Kurds, those destroyers of everything like civilization.

Twice during this part of my route I fell in with bands of Kurds; the villagers were all obliged to watch their fields during the night, lest the sheep and cattle should be turned into them, or the grain which was cut should be carried away. In the spring migration of the Kurds, the young crops are often eaten by their sheep, which are so numerous that a field is speedily cleared, and thus the poor peasant's hopes of a harvest are totally destroyed, or perhaps his crops, which had escaped the danger in spring, are reserved only to be plundered in the autumn.

At *Boäslian*, a village on the road, a great deal of nitre is produced. The soil is strongly impregnated with it.

* Rhamnus infectorius.

† Yúz-kát, *i. e.* hundred roofs? It is spelt Yuzghat by M. Lapie, and was not known to Major Rennell. There are several different and nearly parallel routes from Angora to Tókát.—F. S.

The land here is very arid, and wheat only yields five fold; indeed the whole tract from Kaïsariyyeh to Yúzgát is one of the least productive parts of Asia Minor, and as deficient in trees as all the high land of Armenia.

Yúzgát grew into importance under the fostering care of the Chapán O'ghlú family, who fixed their residence here, and from an insignificant village it became a considerable and flourishing town. It is the neatest and cleanest I saw in Turkey, and is walled. There were some guns to protect the gates, but when the family were removed, the guns were conveyed to Constantinople. The walls served only to protect the inhabitants from the attacks of marauders or irregular troops. The town is in a narrow valley, and is commanded on all sides.

The founder of the Chapán O'ghlú family was a petty Turkomán chief, who by superior address and courage raised himself to the rank of a powerful Dereh Bey, commanding a district which extended over a great portion of Anatolia, and might be called a small principality, which he ruled with sovereign sway. The family maintained its position for two generations, but the third generation were created páshás, removed from their hereditary possessions, and from that moment lost their influence, while their riches became the prey of the Sultán and his court. The father of the present generation was a liberal and magnificent chief, and he spent his princely revenues in supporting his station with dignity and boundless hospitality. Yúzgát is now governed by a rapacious Musellim,* and having no manufactures, and no other produce than grain, is reduced to an insignificant provincial town, while the inhabitants regret their former munificent lords.

A little to the right of the direct road to Tókát from Yúzgát, and about thirty or forty miles from the latter, there is an argentiferous lead mine, called Aḳ Dágh Ma'den,† from the mountain in which it is situated. I saw the director at Yúzgát, and he informed me that about 300 families were employed in the various operations connected with the mine; that since he had the direction it had produced considerably more silver than before, and that he believed a more scientific method of mining would be the means of extracting a much greater quantity of ore at less expense.

I think the quantity of silver he stated to have sent to Constantinople was 300 okes, or 825 lbs., valued at about 3000*l.* sterling.

From Yúzgát I made an excursion to visit some ruins, which were stated to be very extensive, and never to have been visited by any European. They lay in the direction of Boghaz Keuj, which I had determined to visit, as near it are some ruins and

* Governor. † White-Mount-Mine.

sculptured rocks, which had been discovered by M. Texier the preceding year. I reached the small village of Nefiz, which is three hours from Yúzgát in a north-westerly direction. In the village itself are numerous blocks of marble, used in the construction of the cottages, and many of them have letters and words cut on them. In the burying-ground of the village are innumerable marble fragments of columns, and various parts of ancient buildings. There were two funeral inscriptions, of the Christian era, proved by the names as well as by the form of the letters. On a conical hill near, called by the villagers the Castle, were two pieces of marble which had been discovered; they formed part of the cornice of a roof, and were handsomely sculptured. They had fallen together, and were still united; evidently showing that they must have belonged to a building on the spot. At the foot of this conical hill had been excavated the remains of a building, formed of large stones, which had been faced with marble. So small a part was excavated, that the purport of the building could not be ascertained. From another conical hill in face an immense quantity of marble blocks had been excavated, and used in building a mosk at Yuzgát. Not far from thence were some stones of immense size, which apparently have formed the posts of a gate and partly of a wall. The natives told me they found medals, but I could not procure any from them; they said they did not preserve them, as they were only copper. From this place I directed my course to Boghaz Keuj, which was about four hours distant. I reached it late in the evening; next morning I hired a guide, and visited, first the sculptured rocks, which are about a mile and a half from the village. This is a natural inclosure of immense masses of limestone rock, from forty to fifty feet high, apparently fallen from the mountains immediately above, and have assumed the form of a parallelogram, of twenty yards long by ten wide, on which are sculptured figures. They have been in many parts nearly obliterated by the effects of the weather; in some parts, however, the objects are quite distinct. The long line of smaller figures is about three feet in height, then come five larger figures; there are two principal ones joining hands. One of them is backed by three others, and all are standing on the backs of animals. Then comes a line of smaller figures, and at the end, on a rock by itself, is the principal figure standing on two mountains, and holding in its right hand an emblem like an Egyptian symbol of eternity—a circle with wings.

Monsieur Texier has made some beautiful drawings from these interesting remains, but they give you an idea of a greater degree of preservation than the figures are in.

From thence I crossed over a ravine, and at the distance of half a mile came to the site of a vast building. The lower foundations

alone exist, but sufficient to trace the plan, which is in the form of a parallelogram. The stones are of great size, and are rough externally. Around the hills are remains of walls, buildings, and gates, but in a very dilapidated state, and of a very rough construction. Both these ruins are worthy the examination of an antiquarian, to which title I have no pretensions.*

The distance from Yúzgát to Tókát is about 100 miles, in an east-north-east direction. The country is a succession of plains separated by low hills. The plains are well peopled and well cultivated, entirely bare of trees, but they are as productive in grain as any I had seen. The climate is moderate in summer, and cold in winter. Wheat was said to yield, in the most fertile parts, ten to twelve-fold, and in others seven to eight-fold. I met with some tribes of Turkománs which do not migrate; they encamp in the open plains from spring to autumn, and in winter retreat to some sheltered nook on the edge of the plain, building walls against the declivity of a hill and covering them with their tents, as a roof. They are not rich, do not plunder boldly, but are addicted to pilfering. The plains are well watered by small streams.

Ard Ovah,† the last great plain before reaching Tókát, contains about seventy villages, and produces an incredible quantity of grain.

After quitting this plain I came to a mountainous tract with less cultivation and more thinly inhabited, which finally led me through a long, steep, narrow and rocky defile, down to Tókát.

Tókát‡ is placed at the mouth of the defile, which widens a little on approaching the city, on the bank of a small stream, but so surrounded on three sides, by lofty mountains, that the heat concentrated in the narrow valley rendered the place, while I was in it, intolerable. The valley from about three miles above the town is filled with gardens and vineyards, and a number of rills of water run through it The town is not esteemed healthy, autumnal fevers being very prevalent. It contains 6730 families, of which 5000 are Turks, 1500 Armenians, 30 Roman Catholics, 50 Jews, and 150 Greek. The Armenians and Catholics are in general very rich, or at least the wealthiest persons are to be found among them.

As a commercial mart, the importance of Tókát has passed away, the numerous fine kháns are empty, and there did not appear any symptoms of its being an active commercial city. The roads

* I should have examined these ruins more thoroughly, but I was told at Erz-rúm, by a companion of M. Texier, that a full account of the ruins had been published at Paris.

† "Back-plain," pronounced Art-ová. The Turks throw the emphasis on the last syllable, and pronounce final soft consonants hard.—F. S.

‡ From the Armenian Evtogia (Eudocia).

from thence to Constantinople and to Sámsún, are very excellent. The military road from Sámsún to Kharpút passes through it.

From Tóḳát I bent my course to Trebizond with all possible dispatch, in order to meet the Right Honourable Henry Ellis there; and as I stopped only to rest and change horses, I had but little leisure to make inquiries on the road.

The line of road from Tóḳát takes an easterly direction running parallel to the Black Sea, amidst the ranges of the mountains which rise from the plains of Jáník, and which are scarcely lower than the central table-land of Asia Minor; the mountain contains large forests; many fine plains exist, and they are tolerably well peopled and cultivated. There are some considerable towns and numerous villages. The whole tract lies out of the route of Kurd migration, and there is consequently no want of security; altogether it is a beautiful, fertile, and prosperous portion of Asia Minor.

Níksár is distant about 27 miles east of Tóḳát: between them a range of well-wooded mountains intervenes. Níksár contains a population of about 1000 houses; it is situated on the eastern side of a very extensive and remarkably rich plain, watered by the very considerable river of Chár-shambah. Rice is cultivated extensively in the plain. The town is situated amidst a forest of fruit-trees. The climate is warm. There are the remains of the old Roman * town wall, and of a castle of the same period.

From Níksár the road ascends a very lofty range of mountains. The summit is far above the region of trees, and must be above 6000 feet high; crossing this, we continued among the mountains at a little lower elevation, and among forests and meadows, until we descended once more at Kulch-ḥiṣár to the Chár-shambah Sú, along the banks of which the road continues until it quits them to ascend to the town of Ḳará-ḥiṣár, the position of which is very elevated.

Ḳará-ḥiṣár † is distant from Níksár about 70 miles; it contains 2500 houses, and has a considerable trade with the coast and the interior. Kerahsún is the port on the Black Sea with which its communications are most active, and is distant about 60 miles. There is an old castle on the summit of the isolated mountain, around which the town is built. Near this town there are extensive mines of rock-alum, from which the town takes the distinctive appellation of Shebb-khának,‡ there being several other cities in Turkey called Ḳará-ḥiṣár, or Black Castle.

At a small village called Uleh, in the district of Shírván, 48

* Neo-Cæsarea, *i. e.* New Cæsarea.—Ed. † Black Castle.
‡ Shebb-khánah, the alum-office, or alum-works.

miles east of Kará-ḥiṣár, I left the high eastern road leading through Erẓ-rúm, and turned northward towards Trebizond. Between Uleh and Gúmish-khâneh the mountains are more steep and difficult than any I had seen in Asia Minor, except in the Ajerah Valley.

*Gúmish-kháneh,** a town on the banks of the river Kharshút, has grown up around the mines of argentiferous lead in the neighbourhood. The mines were once rich in silver, but the produce now is very small. The system pursued by the government, rather than the want of ore, has occasioned the falling off of the produce. At one time there were 40 furnaces in full employment, there are now only two.

The whole district abounds in ores of copper and lead; few mines are worked, and those which are produce little to the government, from the ruinous system of management pursued.

It is difficult, upon a hasty and extensive journey like this, to give a very accurate or concise summary of the different points I endeavoured to investigate.

The central table-land of Armenia is a fertile corn country, and abounds also in pastures. The slopes of the mountains supporting this table-land are wooded, and the plains at their base rich. The climate on the shores of the Black Sea is temperate, on those of the Mediterranean extremely hot, while in the central parts it is cold, on account of their great elevation. The country is throughout well watered with streams. The passes from the coast to the interior are difficult and easily defensible.

The population is scanty: the greatest portion of the inhabitants are Turks, who find employment as soldiers, civil functionaries, cultivators, merchants and artisans. The next in number, or perhaps not inferior to the Turks, are the Kurds, who live in separate tribes, and wander with their sheep and cattle over the country, from the mountains to the plains, according to the seasons, for the sake of pastures, without, in general, other habitations than their tents. They are warlike, always wear arms, are addicted to plunder, and have been, until lately, scarcely more than nominally dependent on the Sulṭán. It is the object of Reshíd Mohammed Páshá's operations to reduce them to a more complete obedience.

The Armenians, the original inhabitants, are generally engaged in commercial pursuits in the towns, or are cultivators of the land; they are prohibited from carrying arms, and are not called upon to act in the capacity of soldiers or civil functionaries. They are Christians, and I estimate they may form about one-third of the number of the Turkish, and one-seventh of the whole population.

Besides the above, there are in various parts of Asia Minor a few tribes of Turkománs, the remnant of the conquerors who

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* Silver-works.

overran the country. They still preserve their pastoral habits, and very much resemble the Kurds.

The roads are merely tracks formed by the constant passage of travellers and of caravans; they are numerous, and in general sufficiently well marked. In the mountains they are always the same, but in the plains they frequently vary their course, according to the changes which occur in the cultivation of the land. The only exception is the military road lately made by Reshíd Mohammed Páshá, from Sámsún to Diyár-Bekr, a distance of nearly 400 miles, for the transport of his artillery.

The raw productions of the country are grains of various kinds, wool of sheep and goats, silk, gall-nuts, hides, skins, and gums.

The mines yield copper, lead, silver, iron, alum, and salt.

There is a good deal of manufacturing industry, and various articles are made both of cotton and wool, which are partly consumed in the country, and partly exported to Georgia and the Crimea.

By a series of barometrical observations in the city of Erz-rúm during the month of December, 1830, registered generally twice a day, we have—

	English inches.		Thermom. attached.		Fahrenheit detached.	
Highest	24.776	—	40	—	17¼	Dec. 16, at 9 A.M.
Lowest	24.552	—	47	—	33	21, ,,
Mean	24.620	—	44	—	26½	

during which month the mean of 31 double observations at Trebizond gave,

Barometer	30.038	—	55.8	—	56.2

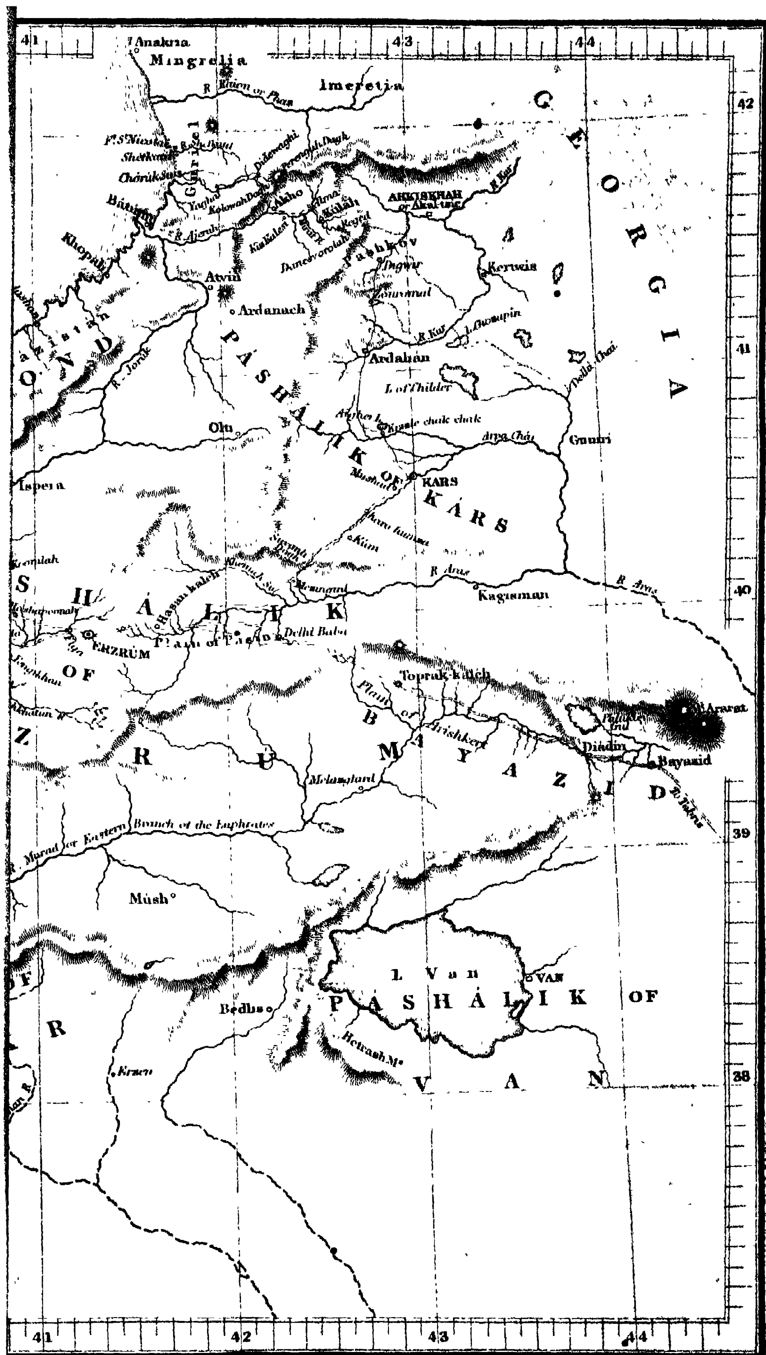
If these observations may be relied upon (and there is no reason to doubt them), the height of the plain of Erz-rúm above the sea cannot exceed from 5000 to 5300 feet, and which, we have very little doubt, will be found near the truth.

ITINERARY.

From Trebizond to Batúm the distance is 60 hours, or as many leagues. It can only be performed in boats; there are no practicable roads.

From Batúm to	Hours.
Chórúksú	4
Jaghat	5
Didewaghi	7
Akho	7
Kulah	7
Danesvorola	5
Digwir	9
Louramel	5
Ardahán	8
Kars	16
	— 73

There are no regular posts on this route, and the distances are stated as paid for. Sometimes they could not be performed in the number of hours, on account of bad roads and bad horses.



Anakria
Mingrelia
Imeretia
GEORGIA
Akhiskhah or Akaltsic
Kerwis
Ardanach
Atvin
Ardahan
L. of Childer
Olu
KARS
PASHALIK OF KARS
Gumri
Ispera
Kagisman
ERZRUM
Plain of Pasin
Toprak-kaleh
Ararat
Diadin
Bayazid
PASHALIK OF BAYAZID
Branch of the Euphrates
Melasgherd
Mush
L. Van
VAN
PASHALIK OF VAN
Bedlis
1836.
John Arrowsmith.

	Hours.		
Karahamza	8		There are posts established, but the horses are bad.
Mezingherd	10		The hours on this part of the route are longer distances than usual, and could with difficulty be performed in the time.
Khorassan	4		
Hasankaleh	8		
Erz-rúm	6		
	—	36	
Yenkkeui	10		The hours here are easily accomplished in the time, but the horses are for the most part indifferent.
Karghan	10		
Erzinghean	12		
Kemákh	12		
Herhemeh	10		
Egin	12		
Arab-gir	10		
Kebban-Máden	10		
Kharpút	10		
Arganá Máden, 12 hours.			
Arganá town	15		
Diyár-Bekr	12		
	—	123	
Eézoglu	12		There is no change in this distance.
Aspusí (Malatia)	6		
	—	18	
Hakim-khan	14		Post.
Ghurun	15		No posts, being across the country.
Manjilik	9		No horses.
Ulash	9		Post horses.
Sívás	6		
	—	53	
Saghileh	12		
Gemerck	6		Good road, and done within time.
Kaissar	12		
	—	30	
Boäslian	12		
Pasha Keuj	10		Good road, and horses tolerable.
Yúzgát	10		
	—	32	
Mughalleh	9		
Yangeh	6		
Saleh Serai	6		Excellent road, and fair horses.
Tókát	12		
	—	33	
Níksár	9		To Ulehsheran the road is generally good, though mountainous, and the horses very fair. From thence to Trebizond the road is the worst I ever travelled; a continuation of precipitous mountains. The horses from Gúmish-kháneh are wretched in the extreme.
Kuleh-hisár	12		
Kará-hisár	12		
Ulehsheran	16		
Gúmish-kháneh	12		
Trebizond	18		
	—	79	

XV.—*Report of an Expedition into the Interior of British Guayana, in* 1835-6. By Robert Hermann Schomburgk, Esq., Corresponding Member, R. G. S.

It will be recollected by the Members of the Geographical Society, that an expedition to explore the interior of British Guayana was decided upon by the Council of the Society in the latter part of the year 1834; and that, upon its being communicated to the Government, it met with the fullest sanction and patronage of his Majesty's Ministers. The instructions of the Council of the Society, which will be found in detail in the annual Report for 1836, annexed to this volume, were consequently transmitted to Mr. Schomburgk, selected to command the exploring party, at George Town, Demerara.

The following pages contain an abridgment of the first, second, and third reports of the first expedition into the interior, with an analysis of the Astronomical and Meteorological Observations, which have been received up to this date; all of which are preserved for reference, and are accessible at any time; as also the original Map, on the scale of 8½ English inches to a degree of latitude; a copy of which, on a reduced scale, accompanies this Report.

In pursuance of his instructions Mr. Schomburgk left George Town on the 21st September, 1835, and coasting round the peninsula of low alluvial land, of about twenty miles in breadth, lying between the two rivers, he reached the entrance of the Essequibo, which discharges itself into the Atlantic by an outlet fourteen miles wide from shore to shore, but separated into four channels by three low islands, the chief of which, named *Wakenaam*, is seven miles in length.

Pursuing our course (says Mr. Schomburgk) up this noble river, whose first or sea reach runs in a north and south direction for about thirty-five miles, with an average breadth of eight miles, we passed successively Hog and Fort Islands; the latter once the centre of all the trade of the colony under the Dutch—now still, lifeless, and deserted, except by a few coloured people, who have built their mud-hovels amidst the ruins of the former capital of Guayana.

Both banks, here only eight miles apart, now for the first time become visible—indeed the river more resembles a lake studded

with numerous wooded islands, bounded on either hand by a dense and almost impenetrable forest, rich in all the exuberant verdure and wildness of a virgin soil and a tropical sun; with occasionally a glimpse of the blue mountains far in the distant south.

At *Itaka* (signifying stone), twenty-five miles from the sea, are seen the first rocks *in situ;* they are granitic, probably gneiss, and project some distance into the river, forming a dangerous ledge, covered at high tide.

Off *Ampa,* a small settlement, six miles farther south, are two remarkable sets of rocks, called the "Three Brothers" and "Three Sisters," one of which, with a little imagination, resembles a gigantic head: a fruitful source of superstition to the ignorant colonist, and the uneducated Indian.

Four miles hence the united streams of the Massaroony and the Cuyuny, flowing from their junction eight miles to the south-west, fall into the Essequibo by a mouth full a mile wide. On the south point of confluence is the Missionary station of *Barteka.*

We here left the main stream, and sailed five miles up the Cuyuny to the post, or station of the post holder,* which stands in a beautiful situation, on a mass of granite full fifty feet above the water, commanding a view of the three rivers,—the Essequibo, Cuyuny, and Massaroony, over which it is his duty to watch.

Mr. Schomburgk remained here some days, engaging Indians as a boat's crew, and other attendants, to accompany him on his expedition. He availed himself of this interval to ascend the river Cuyuny, about five miles above its junction with the Massaroony; it is described as having high banks of loam, and the stream turbid —whereas the water of the latter, though slightly coloured, is clear as crystal.

At Kay-tan, a Caribbee settlement, the chief stated that he had been several times at Angostura, ascending the Cuyuny about 300 miles, in a W. by N. direction, to its source; crossing the short portage which forms the separation of the waters flowing to the Orinoco and to the Essequibo; thence descending the River Carony, and ascending the Orinoco; thus maintaining an inland communication with Angostura and the whole basin of the Orinoco. The journey was performed in a month. A little westward of Kay-tan, in 1721, the Dutch made an attempt to search for silver, but the little ore discovered would not pay the expenses. Some beautiful flowers were seen here, one, called by the Indians Carabahiracarie, of the family of Cambretaciæ; and another, named Toucoushouaheru, probably of the genus Brownea.

* Posts are established on the rivers of Guayana, for the maintenance of peace among the various tribes, and for general protection of the Indians; and also to watch strangers passing up and down.

Cartabo Point, at the confluence of the Cuyuny and Massaroony, was once the seat of government when this country was first settled by the Dutch at the close of the sixteenth century, and which a few years later was removed to Fort Island. On the island *Kyk-over-all*, immediately opposite, was a fort for its protection, now in ruins. Along the banks of the river live many free Africans, who, having intermarried with the Indians, have adopted their manners and customs.

Farther on was visited a Caribbee settlement. These Indians differ from the Arrawaks in some respects: they do not tattoo, but stain their bodies, and especially their legs, with the roucou, a sort of dye.* Their huts are alike. The females fix a tight bandage round the leg, below the joint of the knee and above the ankle; thus giving the calf an unnatural protuberance. They also perforate the lobes of their ears with bamboo, and their under-lip with a row of pins: thus forming a pointed *chevaux-de-frise*, an effectual barrier to any improper freedom. The Caribbees excel in a rude sort of pottery; clay is abundant on the banks of the rivers. They are very expert in the management of their coorials or canoes.

Another excursion was made up the Massaroony, above the island of *Caria*, to the first rapids, about fifteen miles from its junction with the Cuyuny; but this river has been so well described by Mr. Hilhouse, of Demerara, at p. 25, vol. IV. of this Journal, that nothing need be added here.

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On the 1st October, having completed all our preparations, we left the post on the Cuyuny, and began the ascent of the river Essequibo. The party consisted of three Europeans, a military officer, a resident of Demerara, and myself, four Negroes, variously employed as attendants, and the crews of the three coorials, viz.:—five Negroes, five Caribbees, three Macoosie, and two Accaway Indians, in all twenty-two persons; their wages were 4*s.* 6*d.* a-day to each of the steersmen of the coorials; 3*s.* a-day to each of the Negroes; and 1*s.* 6*d.* to each of the Indians—part of which was paid in goods; besides this, their food was found them.

Tracing the Essequibo upwards towards its source, it now assumes a south-east direction for seven miles, to Point Saccaro, where it turns directly south for sixty miles: and it may be remarked that its tributary, the Massaroony, at the distance of only twelve miles to the westward, and the river Demerara, only fifteen

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* This is the Arnotto dye which is employed in this country for colouring cheese. It is the produce of *Bixa Orellana*.

miles to the eastward, hold a parallel course during the whole of this distance.

At *Osterbecke* Point, or Monkey's Waist, of the Indians, five miles farther south, a range of hillocks, about 100 feet high, run east and west; which would be unworthy of remark, were it not that it is almost the first undulation of the alluvial soil between this and the sea, a distance of forty-five miles. The river is here narrowed to only 100 yards across,—whence its Indian name; its general breadth averaging from one mile to one mile and a quarter. The view from these hills is the most picturesque of the Lower Essequibo.

At *Cumaka Serima* is the last settlement below the falls, and the commencement of the granitic region. Small schooners have ascended to this spot, fifty miles from the sea. Its name signifies, in the Arrawaak language, the point of silk cotton-trees.

At *Aritaka*, in latitude 6° 11′ North, we reached the first rapids that opposed our progress. This is the beginning of a series, caused by the river's passage through a chain of hills 200 feet high, which extend for six miles. The most considerable of them is the *Etabally* Rapid; the last, the *Aharo*. These are usually, but incorrectly, called cataracts, yet they are sufficient to prevent navigation farther up than Aritaka.

South of the rapids, the river assumes a new aspect, displaying numerous sand-banks rising above its surface, which obliged us to cross and recross constantly, to avoid running aground. The guana (*Lacerta Iguana*) had selected them as a deposit for its eggs, which, when fresh, are a great delicacy, as is also the animal. Our Indians showed great dexterity in securing them; and in a very short time they took some hundred eggs, and captured several of the guanas.

Our course now lay along the narrow island of Gluck, called *Aramisary Yrupacoo* by the Caribbees, from a small species of tiger-cat which was formerly found here in abundance. It is about five miles in length; at its southern end, the river Tipoorie, the most considerable since the junction of the Cuyuny, falls into the river from the south-west.

The banks of the Essequibo are here from ten to twelve feet high of clay and sand, slightly covered with mould and luxuriant vegetation; behind them extends, generally, a natural ditch, formed by the receding waters after the annual inundation. It was still partly filled with water, containing numerous fish, with their enemy, the heron, stalking about, affording good employment for our guns and our arrows.

On the 7th October we reached the island of Hoobucuroo, where I measured on a sand-bank a base line, which gave the

breadth of the river 1520 yards, and the height of the Arissaro Hills 640 feet, bearing S. ½ E., distant about eleven miles. On the eastern bank the two brooks, Cortuaharo and Moocoo-moocoo, here fall into the river. A well-frequented path leads hence, in a south-east direction, to the Post of Seba,* on the river Demerara, in latitude 5° 45′ North—the highest station maintained: the direct distance is about twenty miles, and it is accomplished in a day. By means of the two streamlets, the Cortuaharo and the Coreta, a tributary of the river Demerara, it is possible, at no distant period, that water communication may be maintained with the Upper Essequibo, with the exception of a portage of only twelve miles; thus avoiding the dangerous rapids of the Etabally. A square-rigged vessel has been known to load at *Lucky Spot*, on the Demerara, in latitude 5° 57′ North; and should colonization extend into the interior, it is probable this will be the line adopted, either by means of a canal of twelve miles, or a portage of about the same distance. The elevation of the land between the rivers is only trifling; the water-shed is rather nearer to the Demerara than to the Essequibo—thus causing a more gradual slope to the latter river.

The forest here reigns triumphant—all traces of civilization are left far behind—above, around, one dense mass of foliage. Pre-eminently above all towers the majestic mora, with its dark-leaved branches—the gigantic mimosa of the western hemisphere, equal, if not superior, to British oak for ship-building; the scarcely less stately and equally useful saouari (*Pekea tuberculosa* of Aublet), which bears a rich and nutritious nut; the sirwabally,† excellent for planking vessels and resisting the attack of worms; some species of wallaba ‡ (*Dimorpha falcata*); the trumpet tree, or cecropia; the water guava (*Psidium aromaticum*), which replaces the mangrove of the sea-shore, and yields an aromatic leaf, useful in dysentery; and many others yet unknown or undescribed.§ Still, though unable to assign each its separate species, the observing naturalist cannot fail to notice that these trees bear blossoms, leaves, and fruit, not their own. The wild vine, or bush-rope of the colonists, is seen, at times, twisted like a corkscrew round the loftiest trees; at others, intertwined like the strands of a cable, then drooping to the ground, and again taking root, and thus, as it were, securely anchoring the tree against the fury of the sweeping blast; the wild fig tree, an unusual parasite, occasionally taking root in some of the topmost branches of the mora, deriving nourish-

* From the Indian word signifying rock, or stone.
† Fam. Laurineæ, near Ocotea.
‡ Eperua of Aublet; Panzeria of Willdenow.
§ Dr. Hancock gives the Indian names of fifty of these trees.

ment from its sap—and this again overrun by varieties of the climbing vine: the whole rendered bright and gay by the brilliant blossoms of the hayowa, or incense tree (*Amyris ambrosiaca* of Willdenow), which perfumes the forest with its sweet-smelling resin —both its gum and its bark possessing valuable medicinal qualities. Scarlet passion-flowers, others white as snow; the *Combretum racemosum*, with several species of bignonia, the most beautiful climbers of our European conservatories, hanging in natural festoons; the crimson flowers of the *Bignonia cherère* of Aublet, conspicuous even here, where all is bright and beautiful.

Oct. 8.—Reached the foot of the Arissaro Hills, which extend in an east and west direction as far as the post Seba, on the river Demerara; they average 600 feet high, are granitic, and well wooded. On first gaining sight of these hills, the Caribbee Indians, who had never ascended the river so far, had to undergo an initiatory sight—which consisted in squeezing tobacco juice into their eyes.

The general wall-like vegetation on each side of the river is occasionally broken by the inroads of the stream, which has undermined the foundation on which it stood, laying prostrate many a lofty tree, whose withering trunks occasionally project some distance over the water; and thus also the outline of the river is slightly varied.

At sixteen miles farther south, the Yaya Hills, about 200 feet high, and upon the eastern bank, cause the river, flowing from the west, to assume a due north course, which it maintains for sixty miles. From this spot, the great fall on the river Demerara is only eight miles distant in the south-east—the nearest point of approach between the two rivers.* Five miles beyond, we reach the Oumai Hills, about 200 feet high, on the left bank, which give the river an east direction, and form the greatest angle in its whole course. We found here a large cluster of lanah trees (*Maripa*), which produce a blue dye, used by the Indians to paint their faces.

For the last few miles, the granitic ledges have had a glazed coating, and the dykes, which here cross the river, had, at a short distance, the appearance of a dry stone wall: they form rapids at *Cumakâ* and *Akramalally*, which we passed with difficulty: the fall of water was trifling, but the sharp edges of the rocks endangered our canoe.

At this night's quarters, on the site of an old post, we were tormented by wood-ants and the bête rouge. Since we reached the region of the falls, we had felt no mosquitos. A meridian altitude of the star Achernar gave our latitude 5° 20′ North.

On the following morning, passed the mouth of the river Potaro,

* According to Mr. Schomburgk's map; but by Captain Owen's survey, the river Demerara here approaches within four miles of the course assigned to the Essequibo.

which falls into the Essequibo from the south-west. Its waters are black, as its name denotes; it is said to have many rapids, and that a short portage connects it with the river Massaroony; rock crystals are also said to abound in the hills, at its source; its banks are inhabited by a tribe of Arrawak Indians.

Streaks of white foam here indicated our approach to another rapid; and on rounding a point, an apparently impassable dyke of granitic rocks, piled in great confusion, with their surfaces glazed with black oxide of manganese, presented itself, crossing the river in a north-east and south-west direction; a connecting line between the ranges of the Cooramucoo Mountains, which here extend on both sides of the river, rising to the height of 1200 feet.

On a nearer view, we found the water pouring through these passages; and, with some difficulty, we hauled the canoe through the rapids formed by this dyke. The scene was highly picturesque, and the distant peak of the Cooramucoo, arresting the light fleecy clouds of morning, gave a character of mountain-scenery, that we, coming from the flat shores of the Atlantic, had been long strangers to.

A short distance beyond, another similar dyke crosses the river, and forms the rapid of Benhoori-Boomocoo. The rock here is, in its structure, the same as that of St. John's Island; and the granite of Arissaro resembles that of Virgin Gorda—specimens of both of which I sent to the Geological Society of London, and of Berlin.

The southern end of the island, Benhoori-Boomocoo, was found to be in latitude 5° 14½′ North, by a meridian altitude of the sun.

The fall, or Rapid of Warapoota, the most difficult yet encountered, took us several hours to accomplish. Immediately south of it, on the western bank of the river, we found a settlement of Macoosie Indians, under their chief, Camboree, better known to the colonists by the name of Macoosie James. The party consisted of about fifty natives, chiefly Macoosies, the rest Caribbees, Accaways, &c., women and children. The women were employed spinning cotton for hammocks; their dwelling was a hut, open on all sides, and badly roofed with palm leaves. The Hayowa gum was in use as a substitute for candles; and not only gave a good light, but perfumed the air with its incense-like odour; cotton dipped in bees' wax also afforded light. We halted here two days, to obtain a supply of Cassava bread, in exchange for trinkets, &c. South of Warapoota, the banks of the river become more abrupt; the vegetation as luxuriant as before; the kamasakata, a tree from fifty to sixty feet high; the warrakarro, whose seeds resemble the abrus; the acowri, bread-tree; and different species of wallaba, are the most common in the region of the falls. We here shot fourteen pacou, from sixteen to eighteen pounds weight; it is a

delicious fish, frequenting the falls to feed on the weira, and various species of lacis.

The river is here a series of rapids; so much so, that, after toiling a whole day, we only accomplished five miles. We passed the night at the foot of the rapid Twasinkie, about two miles north of the mountains of the same name; latitude, observed, 4° 59′ North. The solitude of this river is impressive. Since quitting the post at the Cuyuny, we had met only two canoes; and from the Warrapoota Rapid to the junction of the river Rupunoony, there was not a single settlement. Yet we here saw sugar-canes two inches in diameter, and a stem of seven feet before the branching of the leaves; coffee growing luxuriantly; and various timber trees, whose height and girth surprised me, accustomed as I have long been to the fertility of a tropical clime.

October 15, passed the Twasinkie Mountains, rising 1100 feet above the river—the range extending away to the westward. Three miles beyond, on the eastern bank, the Akaywanna Mountains, about 900 feet in height, stretch to the north-east; and again, three miles farther, on the left bank, rise the Taquiarie, or Coomootie Mountains, to about the same height: these two ranges, projecting into the river on either hand, cause it to assume the form of an S, in its course, for about six miles. In this distance are three falls, the most formidable of which, named Yucoorit, is caused by a dyke of stratified granite, or gneiss, crossing the river in a north and south direction, over which the water, hastened by previous rapids, and narrowed in by projecting rocks, precipitates itself with violence. The surrounding mountains recede, and form an amphitheatre, affording a highly picturesque scene.

The Taquiarie offset of the Twasinkie Mountains derives its Caribbee name from a remarkable pile of large granite boulders, so placed as to resemble a water jar, called Coomootie by the Arrawaak Indians; and by this name they are more commonly known. The boulders are about 150 feet below the highest peak of the hills, which I estimate at 800 feet; they rise perpendicularly to the height of 100 feet, forming a very remarkable feature. The coloured people who accompanied me, and had formerly ascended these hills, described these stones as enclosing a large cavity, partly covered by a square mass of granite. As usual, much superstition was attached to them, and those who had not seen them before were obliged to drink lime-juice, and have tobacco water squeezed into their eyes—to avert the Evil Spirit.*

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* Dr. Hancock ascended these hills, whose sides are covered with red argillaceous earth and ochres. The boulders consist of three huge blocks of blue granite; the second seated upon the lower one by only three points of support; and a third, rather smaller, poised or inclined to the eastward. 'I measured their height,' says

We here found a beautiful orchideous plant, new to me. Its flower was an inch and a half in diameter; the petals of a rich purple, and a velvet-like appearance; the helmet of the same colour; and the labellum striated with yellow. A little above Youmourit is a small settlement of Macoosie Indians; opposite is the Akaywanna Streamlet, a much-frequented path, of six hours, to Demerara River. The Akaywanna Mountains approach the eastern bank—so much so that the river takes quite a western, and even for a short time, a north of west direction; indeed, it meandered through the hills of Akaywanna and Coomootie, which, from both sides, approached its shores. At the foot of some rapids, in the course of half an hour, twenty-one fine pacou were shot and caught, none of less than twelve pounds weight. The rapids were difficult to ascend, there being but little water. We found against the rocks the remains of a coorial, which, on its descent, badly managed, must have been wrecked; or, while ascending, the rope might have given way, and destruction is then almost unavoidable, if the river be full. Broken arrows, bows, and other Indian implements had been found previously, almost a proof that the unfortunate occupants lost their lives. The boat appeared to have split in two on the upper rocks; one half of it we found below, the other one half way up.

The river expanded, and was less studded with islands, as we approached the ridge of the Coomootie Mountains; the highest south-eastern peak bore, in the evening, west, distant half a mile. Heavy showers fell this evening, and made our lodgings uncomfortable. The Indians found it equally so: and, according to the superstitious belief, the chief commenced to *piai* the rain away; a quick movement with the hands and a sound muttered between the teeth was the charm; but the Spirit appeared to be immovable, and after vain attempts, the conjurer was the first who sought shelter under our curtain, which afforded but little protection against the tropical shower. At this moment, a tremendous crash

Dr. Hancock, 'and sketched this curious natural monument with the red stone of the place, having lost my pencil. The height of the column is not so great as it appears from the river; it measured only fifty feet, and is nearly perpendicular. Both the top and sides are covered with luxuriant vegetation; trees of malpighia; the great kofa, or scandent clusia; the boroway; bartabally, and other species of sapota were noticed, and a multitude of the humbler plants; of arums; alpinias; several species of smilax (sarsaparilla); and the wild plantain, one of which grew on the upper edge of this pile of granite, and in its form, and size of the leaves, appeared very like the cultivated plant, the banana, or Musa paradisiaca.

'I spent the whole of Christmas Day with four Indians upon the hills, and could have remained a week with great pleasure. I saw several gullies and cavities on the slope of the hills, and observed some pebbles of red jasper, and those hard crystals known under the name of marawoony diamonds.'

This granitic column is alluded to by Mr. Waterton in his attractive, yet faithful 'Wanderings,' as the 'Giant of the Hills.'

startled us all; the rain had softened the earth, and one of the large trees which stood near the banks, partly undermined by the river, had given way, and fallen into the water. Before it reached the surface, the bearing down of all the minor trees and branches was heard, then the plunge, and lastly the cry of startled macaws, parrots, and baboons: a moment after, and everything was hushed in silence, except the monotonous noise of the falling rain. The safety of our boats was our first inquiry; but near as it had sounded, we soon heard from our watchman that it had happened on the opposite shore.

The streamlet Mourawa waters the southern foot of the Coomootie Hills, and falls into the Essequibo opposite the Rapid of Cooribiroo.

October 16, halted on the eastern side of a large island. The first plant I saw on landing was a mikania (*angulata*), and in its vicinity grew, likewise, the famed mikania guaco. The bitter extract so peculiar to the tribe of Eupatorinæ prevailed in a striking manner in the guaco. I had an opportunity of comparing the two species of mikania, both of which are medicinal; the young leaves possess the bitter much more than the old ones. The natives call it erra-warang, and use a decoction of it in syphilis; but its property as an antidote to the bite of poisonous snakes is not known here.*

Opposite to our halting-place, another path leads to the Demerara River, by the side of the creek Ortuahar. In the afternoon, reached the mouth of the river Siparoony, or Red River, flowing from the south-west, and discharging itself into the Essequibo by a mouth 100 yards wide: the confluence forms a picturesque scene. The Essequibo is nearly a mile wide, and with so little current that it more resembles a lake, skirted on either side by a dense forest—here and there an islet covered with tall trees; while to the north the Coomootie Hills bound the horizon. The *Siparoony* derives its name from the brownish red tinge of its waters, resembling the colour obtained from the bark of the maparakuni; its banks are fertile, and fine timber trees from sixty to eighty feet high abound. At seven miles from its outlet, the river *Booro-Booro*, also of red water, and of equal size with the Siparoony, joins it from the south. Both rivers, we were afterwards told while at Pirarara, have their sources on the northern declivities of the Pacarayma Mountains, at

* Its reputation as an antidote is probably a fable. The real guaco of the Indians consists chiefly of different species of Aristolochia, and such bitter and pungent diaphoretic plants and roots; but none of these antidotes are to be relied on without scarification or ex-suction of their wound. As this is a point of great importance to those who visit tropical countries, the reader is referred to a valuable notice on the subject by the well-known and able traveller and botanist, Dr. Hancock, in the Journal of the Royal Institution, and in the Lancet, 1829-30.—Ed.

a distance of about sixty miles to the southward, and flow through savannahs—their banks inhabited by tribes of Macoosie Indians. The tribes who inhabit the country south of the Itaka Mountains, when bound down the Essequibo, carry their light boats to the head of this stream, and thus descend by a direct route, avoiding the elbow of more than sixty miles formed by the Rupunoony and Essequibo : at one mile and a half from its mouth, this river has a fall, or great rapid. By an excellent meridian altitude of Fomalhaut the junction of the Siparoony was found to be in 4° 46½′ North latitude.

At four miles farther south, we halted at the northern end of the long narrow islands of *Tambicabo*, extending about eight miles, and dividing the river into two channels, which diverge at so great an angle that they have often been mistaken for separate rivers. On the western branch, in a deep bight formed by the river, stood formerly the Dutch post of Arinda—now abandoned. These islands are noted as the haunt of numerous river turtle, which deposit their eggs in the sand-banks.

Our resting-place was selected in the vicinity of thousands of palm trees; but inviting as it appeared at a distance, we found it by no means comfortable, the ground being overgrown by bushwood, and covered with sharp prickles which had dropped from the palms. Wherever the Sawary, a species of palm, is growing, it is indicative of a barren, sandy soil. The chattering of numerous monkeys resounded incessantly from the interior of the wood. The night was beautifully clear, and I had a fine observation of Fomalhaut: the Siparoony Hills on the river's southern shore bore N. 61° W., about two and a half miles distant.

October 18, passed the falls of Ouropocari, where we had to unload the boats entirely. On the eastern side of the fall is a small island, where, it is said, was formerly a large coffee estate; and that, not many years ago, fruits were gathered. It was probably planted at the time of the first settlement, when the Dutch posts extended to Arinda. We landed, and found the remains of a dyke, several fruit-trees and ornamental plants, not indigenous in Guayana, proofs of former cultivation; but it was so overgrown with prickly mimosa, solanum, &c., that we soon gave up our search after coffee-plants.

October 19, in the morning we saw the Maccary Mountains before us, in the south-east; they looked abrupt and picturesque. The river was now free of islands—about 1400 yards wide, and slightly meandering. I saw a number of graceful little palms (perhaps a Bactris), and was surprised to hear that the Macoosies made their celebrated blow-pipes out of a similar species. I cut several, and certainly the pith inside is so soft that it can be re-

moved with the greatest ease. A species at the Rupunoony is said to be still more qualified for it.* In its vicinity grew another palm, called by the natives kirahagh palm, who use it for fencing in the mouths of inlets (kirahagh), to prevent the escape of fish when the water has been poisoned. It is knotted, and the internodes are only one and a half to two inches in length; it is more elegant than the rattan-cane. Passed the falls of Orotoko, or Yellow Falls—a series of rapids, tedious to surmount.

At 4 P.M., the Maccary Mountains bore south-east, distant two miles. Their highest elevation was seen under an angle of 8° 22′; they are very abrupt and rugged, studded with whitish masses of rocks, often perpendicular, and sparely wooded. Their western peak has quite the appearance of a gigantic roof, or gable end. By a meridian altitude of Fomalhaut they are in 4° 27½′ N. latitude. Four miles south of these mountains, the rapids again commence, and continue for eight miles a very labyrinth of islands; in descending the river, the eastern channel, called Amatopo, is commonly used. Pacou abounded here. At our various halts we caught 110 pacous, at an average of twelve pounds each, making thirteen hundred weight, exclusive of other fish.

The granitic masses, called the Rocks of Achra-moocra, which we had seen in our last day's journey, presented quite a new feature. Enormous blocks of granite, or rather of gneiss, many of them black and glossy, from thirty to forty feet high, and from ten to fifteen feet in diameter, occasionally rent asunder, obstruct the river's course for several miles. They are often piled together, and covered with numerous orchideous plants, pine-apples, small shrubs, and a few stunted trees: one beautiful orchideous plant, resembling a young sugar-cane, and crowded with bright yellow flowers, particularly attracted me. The scene reminded me forcibly of the granitic rocks of Virgin Gorda—with the exception that here was an inland river—there, the ocean.

This rocky barrier seems to extend some distance from the banks on either hand, in an east-north-east and west-south-west direction. The depth of water in the intervening channels was found to be from twelve to fifteen fathoms,—a remarkable contrast to the shallowness of the river above and below this spot, which is only two fathoms: the stream rushes between the rocks at a fearful rate, and it cost us great labour with ropes and poles to surmount the rapids.

* This curious instrument, the blow-pipe, is constructed with admirable art. It consists of a double tube, one enclosed within the other, quite smooth within, and so joined as to appear but one. It has been a question involved in much mystery what plant furnishes the Sarbacan. Humboldt imagined it to be some sort of great reed. Waterton gives some very curious particulars respecting its manufacture; but no hint as to the plant from which it is procured. It is shown in Brande's Journal, by Dr. Hancock, that it is derived from a small species of palm (probably a Bactris), and the idea is confirmed by Mr. Schomburgk.—ED.

October 22.—Twelve miles to the south-east we reached the rapids of Rappoo, so called from the Indian name of bamboo (*Nastus latifolia*), which here abounds; rocks and ledges of gneiss, but without the vitrified or glazed coating, form a dyke over which the stream rushes turbulently. The river here forms an elbow; flowing from due south, thirteen miles, the eastern hills cause it to bend sharp to the north-west, which is afterwards its general direction to the junction of the river Potaro, a distance of ninety miles. The river Demerara is believed to hold a parallel course during the whole of this distance, separated only twenty miles to the eastward; and across this interval are numerous tracks, well trodden by the Indians. A long island here divides the river into two channels; the eastern, called Yukoopato; on the western is the Arouan Inlet.

Above the rapids we saw two canoes in the distance—a novel sight, which we had only twice seen since we left the post; and thirteen days had elapsed since we had seen any one but those of our own party. The Indians were Macoosies from the Rupunoony, and on a visit to Demerara River: their boat was loaded with hammocks, large balls of spun cotton, bows of letter-wood, tobacco in leaves, parrots, macaws, &c. The chief, as a distinguishing mark, wore a crown of macaw feathers; and as he had landed on a rocky islet in the river, we paddled there to join him. He returned to his boat, and taking seat on one of the benches, he awaited us with great gravity. Our people bartered for several of their commodities, and gave in exchange knives and scissors; and, after soothing him and his wife with some trifling presents, he promised to take care of some letters to the colony.

The river is now free of islands, and preserves a breadth of 500 yards for some miles; its banks are from twelve to fifteen feet high, of clear white clay, clothed to the water's edge with majestic trees —the current very trifling.

Towards evening, saw the Makerapan Mountains; the eastern peak bearing S. 65′ W.

October 23.—In the morning, saw the mouth of the river Rupunoony, one of the chief tributaries of the Essequibo from the south-west, which we had at length reached, after three weeks' toiling upwards against the stream and the rapids, a distance of about 200 geographical miles from the post on the Cuyuny, allowing for the windings of the river, and about 240 from the sea. Thus we had accomplished about ten miles a day, which may be taken as a general average for ascending this river in canoes in the dry season. The waters of the Rupunoony were of a turbid yellow colour; those of the Essequibo blackish, and the line of division was visible for a considerable extent beyond the apparent junction. At the first glance, the Rupunoony might be considered, and

indeed is so considered by many of the colonists, the continuation of the Essequibo, as, at its junction, it falls in from the south-west; whereas, the Essequibo here comes from the east. But besides the different colours of the water, the same features, the same peculiar vegetation, and a greater volume of water mark the Upper Essequibo. We halted for the night on the western side of the river by the side of a small kirahagh, or creek, where, by good meridian altitudes of Fomalhaut and Achernar, the latitude of the confluence was found to be 3° 57′ 45′ North. We noticed here a species of haiari; the wood is used by the Indians for poisoning the waters, to catch fish. It is a ligneous climber, or bush-rope, as it is called here, with pinnated leaves and papilionaceous flowers—possibly a new species of *piscidia.**

We had expected to find a settlement of Indians here; but, owing to death or sickness, they had removed. The crews of my canoes were only engaged to bring me to the first settlement on the Rupunoony; and as we had been for the last six days without bread, living entirely upon fish and not good water, half the crew were laid up with dysentery. I therefore decided upon pushing on, contrary to my first intention.

The difference of temperature of the black and white waters was tried both here and at the Cuyuny. The results were as follows:—

September 25. Temp. of air at 7 A.M. - -	79° Fahr.		
Temp. of the river Massaroony (black)	84 ,,		
Temp. of the river Cuyuny (white)	83 ,,		
		Of Essequibo (black).	Of Rupunoony (white).
October 22. Temp. of air at 6 A.M.	75°	82°	80°.5
,, ,, at 6 P.M.	80	83	81

The line of division of waters was evident, and the thermometer was inserted thirty yards on each side of it.

October 24.—Commenced the ascent of the Rupunoony, which, for the first ten miles, holds a west direction, curving to the southward; the river about 200 yards wide, and often not more than three feet deep; the banks of a yellowish clay, with sand.

The vegetation of this river is far less luxuriant than on the Essequibo: the banks are lined with the water guava, conspicuous by its light green leaves and snow-white blossoms; and clusters of the sawary palm—a sure sign of poverty of soil.

The banks are abrupt, about sixteen feet high, and show the different levels of the river since it began to fall, by the horizontal stripes of sand and detritus.

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* If examined attentively, it will be found to be the Robinia Scandens of Willdenow (Lonchocarpus Ni[illegible] of De Candolle), or a variety of it, which Dr. Hancock states his having seen used at the falls below.

Halted for the night at the Aourimah Inlet, at the foot of the Makarapan Mountains, which here rise boldly to the height of 4000 feet. Latitude, observed by Fomalhaut, 3° 55′ North.

For several days past the Caymans had shown themselves very commonly. To-night, one full sixteen feet long came close to the bank to reconnoitre us. We saluted him with balls, which we saw strike, but took no effect,—he only plunged and reappeared, apparently to watch our movements.

October 25.—The river winds in short turns along the southern foot of the Makarapan Mountains. On the following morning, passed the River Taraqua (the Rewa and Quitaro of the maps), and soon after landed on the left, or northern bank of the river, to take a view of the first savannah we had seen on our voyage: fine mountain scenery in the distance towards the north, and also in the east. A few miles farther we pushed a small canoe up the streamlet Curassawaak to the south, in search of a settlement of Indians and food. We found the cassada field in good cultivation, the huts well built, and some newly thatched, earthenware pots, balls of cotton, a hammock half-finished—everything denoting recent occupation; but no living creature to be seen; all deserted and lifeless. Various were our conjectures as to the fate of the natives—fire, hostile attacks, sudden surprise by a neighbouring horde—all in vain. We were obliged to return empty-handed to our half-famished crew, whose disappointment was excessive. At last, a solitary Macoosie made his appearance, who lived in a temporary hovel on the banks of the Rupunoony, and solved the enigma. One of the chief's wives had died; and in consequence, although the settlement was quite new, the houses most comfortable, the cassada still in the field, every man had abandoned it, and left this poor Indian to look after the crops. But he to live in the devoted village! No, not on any inducement!

The chief Jacobus had removed to the hills in the north, and thither we were fain to follow him, although a whole day's journey distant.

The river hence winds towards the north-west, bounded on its left bank by the savannah; it widens to 200 yards, and the vegetation seems now fresh and luxuriant. Before us extended the range of mountains, where we hoped to find food, and shelter, and rest.

A few miles farther, we reached the rivulet Annay, flowing from the northern hills, and falling into the Rupunoony, where it makes an elbow, and turns to the south; and this rivulet, on what authority I know not, is usually considered the boundary between the British and Portuguese possessions on the Rupunoony. Latitude 3° 52′ 30″ North. Longitude 58° 32′ West of Greenwich.

We landed here, and endeavoured to open an intercourse with

the Macoosie Indians, who inhabited the villages seven miles to the north, at the foot of the mountains, which we effected, by means of presents of looking-glasses, beads, &c.; and the following morning, October 28, we transported our baggage, collections, &c., to the Macoosie settlements at the foot of the mountains of Annay—where we took up our quarters in an Indian hut, which, however humble, was luxury when compared to the cramped up position of our coorials, and the privations and toils we had been exposed to during our voyage of a month, in which we had accomplished more than 250 miles against the stream, and forced our way over innumerable rapids and barriers.

Mr. Schomburgk passed the whole of the month of November stationary at Annay—recruiting the health of his party, which had much suffered, in obtaining information from natives, collecting and preserving specimens in natural history, laying down his route on a map, and making astronomical, trigonometrical, and meteorological observations, for the position of the place—the site and elevation of the mountains, and for the temperature of the air.

From various meridian altitudes of different stars, the latitude of Annay was found to be 3° 56′ North, and its longitude 58° 36′ 15″ West of Greenwich, by several sets of distances between the sun and moon, and between the moon and stars both east and west of her.

The positions of the different mountains and remarkable points in sight from his station were obtained and projected on the map, with various heights of mountains, as Annay, Moonoshabally, &c., measured by a base line along the savannah.

The weather during the month of November, at Annay, was remarkably fine,—only two very wet days occurred, and eighteen without a drop of rain. Temperature of air during this month was—

Highest	89° Fahr.	Nov.	28th at 2 P.M.
Lowest	72° ——	——	5th at 6 A.M.
Mean	82°		

It is remarkable that a strong N.E. wind set in every evening at eight o'clock, reached its height about midnight, when it swept, hurricane-like, across the savannah, and gradually ceased towards daylight, when it veered to nearly east.

After sunset it was usually calm, and the evaporation of the plains increased the heat of the atmosphere, and produced profuse perspiration; when the N.E. wind sprung up at eight o'clock the thermometer suddenly fell 5°, and it is not improbable that the sickness which all the party suffered from while here may be attributed to this sudden change. The water also was far from good.

The settlement of Annay* is placed at the eastern foot of the Sierra Pacaraima, a mountainous range of no great elevation, not exceeding in its eastern part 1500 feet, and which extends from here in a direction nearly west about 200 miles, forming the separation of waters of the basins of the Orinoco and the Essequibo on the north, and the Rio Branco, a tributary of the Amazons, on the south.

The geological structure of these mountains is chiefly granitic; the Moonoshabally, or 'twins,' are of flinty quartz, and occasionally much chalcedony is found. They are, generally speaking, bare of wood, and seem to form the boundary between the vast savannahs to the south and the luxuriant forest of Guayana to the north. The soil at the foot of the mountains is good. The savannahs, on the contrary, are only covered with short grass, and occasionally bare of all vegetation—here and there groups of stunted trees: yet the savannahs of Pirarara and Conocate support numerous herds of cattle and horses, descendants of those escaped from the Brazilian government cattle-farms, and also deer, yet they never wander to the eastward of Annay. The rivers Rewa and Quitaro are laid down from angles taken from elevated positions, and from information gleaned from the natives. The Quitaro appears to rise at the northern foot of the Cara-etayoo Mountains, in lat. 2° 50′ North; thence to hold a north-north-west course through the range called Sierra Taripona, where it flows round the base of a remarkable pyramidal mass of granite rising 700 feet above the plain, called Ataripoor, or Devil's Rock; and shortly after falls into the river Rewa, coming from the south-east, which thence pursues its course to the Rupunoony. The banks of the Rewa are sparely inhabited, but much frequented by the Indians during the season to take the turtles' eggs, which are found in abundance on its sandbanks. The country between the Rewa and Essequibo is thickly wooded and uninhabited.

Second Report, *dated Curassawaak, Jan.* 15, 1836.

The river Rupunoony being generally marked, from its source to its northern elbow, as boundary line between British Guayana and the Brazilian territory, and finding it impossible to procure a crew to accompany me higher up the Essequibo, a terra incognita to all the Indians on this side, I resolved to ascend the Rupunoony as far as circumstances would permit it.

The chief Jacobus (Yhrayee) was to accompany me with fourteen Indians, partly Caribbees, and partly Macoosies. Every

* Annay signifies maize in the Macoosie language; it is said to have been found here wild.

arrangement was completed, and my companion and myself went from the settlement at Annay with the last transport to the river's bank. What a sight at our arrival there! Indians, men, women, and children,—baskets with provisions, our trunks and cases,—all were mixed in the greatest confusion. The red hammocks slung from tree to tree, fires with pots on them in various directions, all realized the picture of a gipsy camp.

The Indian does not like to leave his wife and children at home when he undertakes a journey of several weeks' length, partly from jealousy, partly from indolence, having all his wants provided for by his wife. Though Jacobus had assured me that there would not be more than three women and his child, we found, to our great astonishment, that our whole number amounted to thirty-three.

December 1.—We started in three coorials. The river meanders along a south-eastern offset of the Parime Mountains. Its banks are of a light yellowish clay mixed with sand; trees of moderate size skirt the banks, and immediately behind them extend the savannahs to the foot of the mountains. The river was so shallow that the Indians were obliged to push the coorials forward by means of long poles, and only rarely were they able to use their paddles. Sandbanks were frequent; yet it must be remembered it was the height of the dry season. We observed black porous rock lying on the banks, or embedded in the clay. Banks of gravel occur, consisting chiefly of small irregular fragments of quartz and granite.

The Rupunoony forms many inlets or creeks, called kirahaghs by the natives. We passed several during the day, of which only Assicouneh deserves to be mentioned. At its mouth it is wider than the river, but within it narrows to about three yards, and shortly after expands to a small lake alive with fish and waterfowl. The kingfisher (alcedo), called by the Caribs sacka sacka, and by the Arrowaaks saxicarlie, is the most common bird in these regions. We noticed four species, one of the size of a sparrow with a fine orange breast (in Caribbee sarrie-curou). Divers (carara of the Caribs) are likewise very numerous.

We halted opposite Sawacko-toonally, or Rain Mountain, to which some superstition attaches. It is the highest of this group, which here causes the river to form an abrupt angle to the eastward. The mountains are mostly bare, with occasional patches of wood. Boulders of granite, some of immense size, lie on their sides.

We passed a small rapid in the afternoon formed by the porous rock before mentioned. The river continued its winding course to the south as we ascended the stream. Vestiges of its last inundation were observable wherever it made a turn, and in many places trees broken down by the current, or withered away, gave its banks the appearance of a tropical hurricane having swept

over them. The mountain Apayabo Optayo (Macaw's Mother) approaches quite close to the shore. We were told that it possesses two remarkable caverns on its northern side. The mountains increase in height; we estimated them often 1500 feet. The river's general breadth is about forty yards; but south of the creek Bononi it narrowed at one spot to thirty yards, widening to its former breadth almost immediately after. The vegetation appeared here more luxuriant than we had seen it for some time. Noticed some fine mora trees. Passed the mouth of the rivulet Simmony to the east. On its banks live several Macoosies. It is very narrow at its mouth, but widens and forms several lake-like sheets of water. Its banks are low, and appeared more fertile than those of the Rupunoony. One mile beyond are the porous rocks called Karinampo, having the appearance of a row of men, in an E.N.E. direction, and from twelve to fifteen feet high.

On our arrival at the inlet Wy-y-poocari, we were informed that the commandant of the Portuguese fort San Joaquim, to whom I had previously written, was at the village of Pirarara; a messenger being sent there, Captain Cordiero came next day himself with led horses. We rode with him as far as Pirarara, a fine village of fourteen houses and from eighty to a hundred inhabitants, remarkable as lying on the border of the once famed Lake Amucu.

After a day's rest Senhor Cordiero and one of my companions proceeded to Fort Joaquim; I myself returned to the inlet.

Next morning we continued our ascent of the Rupunoony: the banks were wooded occasionally. Savannahs approached the river on its eastern side. We ascended one of the banks to take a view of the savannah. No Indian living near it, the grass had not been burnt, and had its full growth. It was six feet in height. The savannahs appeared to extend from four to five miles to the eastward, and were bounded by gently undulating, well-wooded ground. The mountain chain of Conucon bore nearly south.

We passed the mouth of the streamlet Waa-ecourou. During the rainy season it affords a passage to the rivulet Pirarara, and thence to the river Branco. At present there was a sandbank at its mouth with scarcely two inches of water over it. On the streamlet Mourackiarou there is, at some distance from its mouth, a settlement of Macoosies under their chief Arriance. The Coucourite Palm here becomes very frequent along the river's bank; its fruits afford a fine oil. We observed in its neighbourhood a palm tree even more graceful than the Coucourite, which the Caribs call Courába.

The nearer we approached the mountains the more turnings made the river, and the shallower it became. Its banks have,

however, a more lively appearance, and we singled out some noble trees; even some silk cotton trees (Bombax globosum, in Caribbee maccau) would have done honour to the banks of the Essequibo. The heliconia (bihai) with its large green leaves, and the leafless jacaranda covered with numerous blossoms of the finest blue, relieved in a great measure the former monotony of the vegetation. Passed the rapids of Curowatoka, which may be considered the key to the country of the Warpeshana Indians. The stream Mapirée, flowing round the northern foot of a hill of the same name, joins, at the entrance of the mountains, the Rupunoony from the east. It has fine, black, cool water, quite different from that of the river. We now approached the mountain range known by the name of Sierra Conocon, extending thirty miles in a N.E. and S.W. direction, through which the river Rupunoony has forced itself a passage, carrying a width of about 130 yards; in many cases the mountains rise abruptly to the height of from 2000 to 2500 feet. They are granite, well covered with wood, and inhabited by a numerous tribe of Indians called Warpeshanas, or Mapeshanas. The Brazilians term the whole of this range Conocon, meaning 'wooded,' in opposition to Pacaraime, which means 'bare;' whereas the natives call parts of them also Mapure, Touroo, and Mapirée. We observed on the banks of the river two species of palms which we had not before seen: the one, small and graceful, grows in groups, and is called Maraniara; the other slender, often fifty feet high, and has only a few leaves of a light blue colour. They had neither flowers nor fruit.

The river had been for the last few days so shallow that we had often been obliged to get out of the coorials, and to wait on a sandbank until they were pushed over. As we advanced, it often took us hours to accomplish a short distance; indeed, it would have been easier to have walked, wading from sandbank to sandbank. I had not expected this where the mountains would have led me to believe that the current caused by rains, and the more rapid descent of the river itself, might have carried the detritus farther towards its mouth. Indeed, we found it impossible to continue our journey in the larger coorials; we therefore decided to form an encampment, whereat to leave the women, children, and effects, and to proceed with only a small coorial and the most indispensable articles.

We selected the mouth of the streamlet Arripai for this purpose, not far from a settlement of Warpeshanas.

On landing, all hands set to work to build temporary huts. It rained hard, and every one was anxious to get under cover. We heard the axe, hatchet, and cutlass resounding in all directions, and many a young tree or a graceful palm came to an untimely end.

The rain descended for several days in torrents. Since my de-

parture from Pirarara I had been attacked every other day by severe fever and ague; my situation therefore in a hut covered only by a sort of wax-cloth, open to the rain from all sides, with the thermometer at 78° Fahr. at noon, was certainly not to be envied. We left, nevertheless, the 15th December, in the small coorial with only four Indians and Jacobus. We soon found that the rain had not extended far south, and we were obliged even to leave the small coorial, to lighten her, and walk over the sand-banks.

The banks of the river were, in the commencement, low, well wooded, and with high mountains, sometimes at a distance, sometimes approaching the bank of the river, which wound through the chain—its course being often turned in quite a different direction by a dyke of granitic rocks, or a projecting point of the mountains. At these sudden turns, desolation appeared to have spread its empire. During the rainy season, the current being so much increased, encroaches upon the banks, carries away the earth, and the trees next to the shore fall into the water; but it is not only that trees are uprooted, the neighbouring ones also perish, whether injured from the force of the water, or otherwise, I know not. The river was consequently often so barricaded by trunks and branches of trees, that we had often to wait for hours until a passage was cleared. At some places we had to force our way through sand-banks, by cutting channels,—the width of the stream being only a few feet, though its bed extended to forty yards, and often more.

The outline of the whole mountain-chain is chiefly conical, seldom undulating; its tops and sides show occasionally granitic walls, of rugged appearance; nevertheless, they are much better wooded than the Parima Mountains, and naked hills are quite rare.

At a dyke called Peroupan (Dog's-ear), granitic veins of rich composition traverse the base of a platform of rock. On the mountain opposite, called Macapoo by the Warpeshanas, there is a settlement of that tribe; indeed we had entered the territory, or land of the Warpeshanas, since the rapids of Curowatoka.

The state of the river obliged us to discontinue our progress by water: it was now a small insignificant mountain-stream. We landed, therefore, and had our coorial unloaded and hauled up.

Since we had left Annay we had no reason to complain of the mosquitoes; there were few or none at our night quarters; but in lieu of them we had from sunrise until sunset to endure the painful bites of a small fly, which were in thousands on the river. Wherever they alighted, either on the face or hands, they drew blood, and a spot remained for weeks. The poor Indians, uncovered as they were, presented a pitiful appearance, in consequence of the

stings and swellings which followed them. The Caribbees call the insect mapiré.

Next morning early we wandered over the savannahs, which, as we left the mountains, approached the eastern bank of the river, and went to a small settlement of Warpeshanas, where we purposed to provide ourselves with provender. The distance was not great. On approaching the place, we observed that it consisted of a dome-shaped hut, and two smaller open ones. A number of Warpeshanas had assembled from the neighbouring places, as we found hereafter, to have a Piwarrie feast: they were fine formed people, and taller than any Indians I had before seen. In their dress they are not distinguished from other tribes; but their language is so different from the Caribbee and Macoosie, that they cannot understand each other. Many of the different tribes speak Macoosie, by means of which they are able to converse with each other.

The men all came forward, and greeted us in a manner similar to the Macoosies,—namely, waving the hand before our face; afterwards they retired, and a lively conversation, mixed with loud laughter, took place; the subject of which was, doubtless, our persons, dresses, &c.

I looked for a moment into one of the open houses, where women and children were occupied in baking fresh cassada bread for the feast. What an uproar when I made my appearance! The children ran away, screeching; fowls and parrots followed; and barking dogs had every intention to attack me, but remained at a respectable distance, only increasing their barking the nearer I approached.

Though our Indian crew were as much strangers to the dogs and parrots as we were, they showed no alarm at their approach; but as soon as we presented ourselves, the noise of birds and beasts was insupportable.

The circular house was differently built from those of the Macoosies: there were no walls of clay; only the entrance was plastered; all the rest consisted of palm leaves plaited neatly together. The interior resembled entirely a cupola, or dome, supported by three beams, and several oblique posts. Around it the hammocks were slung, and the different implements of the kitchen and chase ranged against the walls. The middle was occupied by a wooden trough, carved and painted after Indian fashion, which, on this occasion, was filled with Piwarrie, although it was so large that it might contain sixty gallons. The guests assembled for the feast had slung their hammocks partly in the circular house, partly in one of the open huts, while others stood outside, each party being attended by a person highly painted and

ornamented for the occasion, to bring them the intoxicating liquor when wanted.

Fever forced me to keep my hammock, and I had thus an opportunity to watch their proceedings.

On a signal given by the host, or one of the guests, the calabash was filled and handed to the person who desired it, then given to his neighbour; and thus they continue until it has made the round: but little rest was granted to the bowl, and, before many hours had elapsed, the large trough was emptied, and again filled from immense earthen vessels which had been kept in reserve.

The conversation became, meanwhile, most violent;—old feats of valour, meeting with tigers, &c., were their subjects; but before the second trough was emptied, one tongue after the other became silent, and sickness appeared to have taken possession of almost every individual. Thus is the beverage, uncleanly already in its preparation, misused, and man is degraded.

The Indians have been accused of want of affection towards their children. I have seen frequent instances to the contrary. Great injustice has been done to them in that respect. A Warpeshana returned from a few days' journey, and it was a pleasure to see his children flock around him, hang about his neck, and putting a thousand questions to him; very likely about his success, what he had brought them, &c. He took some cashew nuts out of his queck, or basket, which caused them great joy, though they might have been got as good at a few yards' distance. His wife brought him the youngest child, a baby; he caressed it with the same fondness as a civilized being would do.

They show much more attention to their wives than I should have expected from what I had read. I allude to the Caribbees, where the women appear to be considered more as companions than slaves. They certainly must work hard; the men clear the ground, and the women have to cultivate it, and to bring in the crop; but they are by no means the low slaves and drudges which they have been represented. There is one great failing which unfortunately appears to prevail among all the tribes—neglect of old persons and the sick: they are stowed away in a small corner of the house, neglected, and left to themselves; and where weakness keeps them to their hammocks, perhaps often without the necessaries of life.

Our journey to the southward across the savannahs, on the eastern bank of the river, was to commence next morning (the 19th December): trunks, and all other things which we could spare, were to be left behind; and our whole effects consisted, therefore, of a second suit of clothes, hammocks, chronometer, sextant, artificial horizon, compass, &c.; all of which were carried in quecks,

or baskets; our provision was calculated for ten days. We had to make a detour, in order to get some plantains at a place we had visited the day previous. Among other Indian curiosities, I observed a large string of the lower jaws of the howling monkey, hung up as a trophy of the host's prowess as huntsman. Our first journey was of short duration; the intermittent fever attacked me so violently on the way that we were obliged to stop at the last Indian settlement at an early hour. The chain of mountains is here at a short distance from the house. One of the Indian boys brought me a beautiful piece of crystallized quartz, with laminæ of mica. On my return from the Corona, I examined the mountains, and found the crystals were partly embedded in gypsum. Direction of strata north-west, and the place surrounded by numerous boulders of granite.

December 20, we continued our journey, accompanied by many Warpeshanas, who intended to make it a trip of pleasure; three had been engaged on certain terms, as carriers of provisions, and guides. We followed the foot of the mountain-chain on our left, rising to a height of from 500 to 1000 feet, chiefly of a conical shape; and on our right were small hillocks, bare of wood, and covered with blocks of granite.

The expression of 'Indian file' is well known; but to-day I saw it in all its perfection. Our party consisted of eighteen individuals, and the path leading through the savannahs not being wider than from six to eight inches, we had to follow close the footsteps of the person before us. Sometimes the path was lost, or became smaller than stated above: this is immaterial to the Indian,—his peculiar method of walking with the toes inward enables him to walk the smallest path with comfort, while it incommoded us. They ridicule our method of walking, and observe that in a wood we take up too much bush-room.

We crossed the rivulet Akataurie (Cardoaur in Warpeshana), flowing from the east. This brook winds itself through the mountain-chain; and from this place there was formerly a path to Mahanarwa, the late Cazique's settlement. According to Jacobus, the distance is three days' journey, and from thence one day to the River Quitaro.

The *Malpighia verbascifolia* was here only in blossom, while, at our leaving Annay, a flower of that plant was scarcely to be discovered. It spread over whole savannahs, and its bright yellow flowers, and light green leaves, silvery below, were very pleasing. We shortly came to a tree loaded with fruit, of the size and appearance of a black cherry, and of delicious taste, resembling custard; it is milky, and contains one or two flat seeds; the leaves are bright green, entire and lanceolate. The Caribbees called the fruit 'parata,' the Warpeshanas 'witchaway.'

We passed several large beds of quartz, which crossed the savannahs in a north-east and south-west direction. From what I could observe, they consisted of loose fragments, being raised sometimes only one or two feet above the savannah. The quartz itself is milk-white, passing into rose colour. Quartz is here one of the most prevailing rocks.

In the afternoon we reached the southern foot of the mountains; they here trend to the east-north-east. The Saeraerie Mountains on the river's western shore are the highest of the chain; they are conical and rugged, but well wooded at the base; they are probably Humboldt's Sierra Vassari, or Wassari. The Indian tribes, however, living in this neighbourhood, call them Saeraerie. At their north-eastern extremity rises a pyramidal mountain, the top consisting of granite. Its shape is so peculiar that it cannot fail to attract attention; it is quite isolated, and called by the Warpeshanas, Ochlapan.

Our Indians pointed out to us a hill of moderate height, which, at the foot of the mountain-chain, bore S. 77° E.; distance ten to twelve miles. It is framed for wild plantains of large size (*Musa paradisiaca*), which they told us grew there in great quantities. They pretend that no Indian had ever been there, and that they had not been planted by human hands. The hill is called Vivie Mount.

We had for some time lost every vestige of a path; and our guides conducted us according to landmarks: our course was usually south. We halted at the brook Arraquay, according to an observation of Achernar, in 2° 45′ N. latitude.

The milder attacks of my fever had led me to hope that after the seventh fit I should get rid of it. Vain were my hopes; my ague was so severe next morning, that we were obliged to give up our intentions of proceeding on our journey that day.

I found now that it had fixed itself, and that it would require peculiar attention to drive it out of my constitution. I would not have mentioned these circumstances, as they can be of little interest to the reader, if they were not of importance to my further proceedings.

We broke up our encampment before daybreak, crossed the brook, and followed our guide through the savannahs. We had to wade several Eta swamps by no means pleasant, and though I looked always with renewed pleasure on that majestic palm (*Mauritia vinifera*), it was somewhat damped by being aware that we had to cross another swamp.

December 22, at eight in the morning, we reached the Cartatan, or Corona of the Portuguese, the largest fall of the Rupunoony. It is formed by a granitic dyke, which crosses the river in an east-north-east direction. At several places while crossing the savannah, we had observed isolated blocks of the same composition, which is remarkable for numerous circular holes, as if artificially formed.

The river was very low; the fall had lost its grandeur, and was not to be compared with any on the Essequibo. A little below the fall, the rivulet Maycar, and a little above, the stream Fournacou, join the river from the westward. In the afternoon we mounted an isolated hill, which, at two miles distance from the Corona, rose out of the savannah, and afforded us an extensive and beautiful view. Far in the south-eastern horizon, at the distance of from fifty to sixty miles over the flat savannahs, rose the Carawaymee Mountains, stretching east and west, and apparently of less height than either the Parima or the Conocon, and most probably the Sierra Acaray, or Tumu-curaque of our maps. Our Warpeshanas said they were inhabited by many Indians of their tribe, while some mountains more to the eastward were peopled by Atorroys.

Two of our guides, who said they had travelled in that direction, pointed to a high summit in the chain, whence they said the Rupunoony had its source, then receiving from the eastward a tributary, and forming at their junction a large Eta swamp. When the river became visible, it wound through the savannahs, spreading itself into lake-like sheets of water, or diminishing apparently to a silver thread.

From its sources it assumes a north-western direction, and finds no interruption till it meets the Paha-etecyan, or Cassada-Bread Hills, on its western bank. A few miles farther it forces itself through a bed of stratified granite—then spreads into many channels over a bed about 400 yards wide—again narrows, and rushes over a granitic dyke forming the Corona, or upper fall of the Rupunoony, distant nearly 160 miles, allowing for windings, from its outlet, and making its whole course from its sources in the Carawaymee to its junction with the Essequibo 220 geographical miles.

The latitude of our station here was 2° 36½′ N., and some miles to the southward of the spot usually assigned as the source of the Rupunoony, which, from our own bearings, and the information we obtained, must be in about 1° 50′; or perhaps in the second degree of N. latitude.

This was our most southern point. Gladly would I have explored the river to its sources; but the want of water for even our light canoes, a severe intermittent fever, and the approaching rainy season, would not allow it. All we could accomplish was to get the bearings and direction of the various mountain ranges, which our elevated post gave us a fine opportunity for doing. In the south-west horizon rose the Amaycuree; more to the westward, the Pongheatee; to the north-west, the Dororou, and the Ursato Mountains; all more or less connected with the Saerarie Range. The hill we stood on was covered with large angular masses of

quartz, occasionally milk-white, at times passing into a deep rose colour. The savannahs immediately around us were of a whitish clay, whence the river receives its milky appearance, and were covered with numerous grasses and plants: the river meandering through these extensive plains marks its course by a fringe of trees. Similarly fringed are all the small streams, of which the Rupunoony is the recipient; and thus the monotony of a savannah is much relieved: numerous deer, but never in herds, graze here undisturbed,—the nearest Indian huts at the foot of the surrounding mountains being from fifteen to twenty miles distant.

Having completed all our observations, we reluctantly bent our steps to the northward; and on the following day reached our encampment at Aripay.

When I planned my ascent of the Rupunoony River, it was one of my chief intentions to see the plant from which the Indians prepare their celebrated Ouralie, or Wourali poison. While at the Lower Rupunoony, I had been always told that it grew on the Conocon Mountains; and I soon found that a journey of one day and a half would bring us there. After our return, guides were therefore engaged, and we started on the morning of the 25th December. Our way led us first to the south, over pathless savannahs, until we met a place in the Rupunoony where we could ford it; then through a mountain pass, and before us was a large arid savannah. We turned now to the north, meeting with plains covered with wood, or low shrubs and coarse grass, bounded on both sides by the mountains. It was a wild road crossed frequently by streams, most of which were now dry.

At five miles the ascent commenced; and by no means an easy one. The path, Indian-like, led over fallen trees, between boulders of granite, and was often so steep that we had to use hands and feet: I wondered only how the Indians, with their burdens, could climb up. After a march of eight hours and a half, we reached a settlement of Warpeshanas, where we intended to rest for the night. The thermometer, which had ranged at the settlements on the savannahs 88°, stood here at three o'clock 80°, and next day, at the same hour, 79°.

We recognised in the chief person 'Oronappy,' one of the guests at the Piwarrie feast at Annay. He showed great joy at our coming, brought us a calabash with the favourite drink, and come ripe plantains. He dispatched some person to his field, who soon afterwards returned with a load of the finest sugar-cane I ever saw; indeed the fertility of the soil was astonishing, although the height was between 2300 and 2500 feet above the plain. The size of the plantains, and the sweetness of the banana, surpassed by far those of the plain. The dark, or purple banana, so much esteemed at the colony for culinary purposes, &c., grew to perfection.

The cotton which had been collected around the house was likewise of good quality; nevertheless the fertility of the soil profited only a few. The difficulty of the ascent, and the distance, seclude them from those in the valleys; and the productions of their fields rot on the ground, and become useless to man.

After every effort to dissuade us from our journey, we started the following morning by a difficult path. Indians only could have guided us, and they directed their course mostly after broken branches, or marks cut in the trees, sometimes standing for several moments to consider in which direction to turn. It was a path over hill and dale, mostly in a north-north-west and north-west direction.

We passed a maran tree (*Copaifera officinalis*). It is a lofty tree with light grey bark, a fine branching head, and pinnated leaves. The Indians cut a semicircular hole towards the bottom of the trunk to the very heart of the tree. At certain seasons of the year, chiefly in February and March, the balsam flows abundantly, and fills the hole in the course of a day, when, next morning, it is put into calabashes, and forms an article of barter.

We found a large quantity in the hole; it was of a yellowish colour, and quite clear. Our Indians eagerly anointed their bodies and hair with it. The medicinal qualities of the balsam copaiba are too well known to be repeated here.

Our guides stopped at last at one of the glens, near a spring; and, going to one of the ligneous twiners which wound themselves snake-like from tree to tree, they called out 'Ourari,' the name of the plant in Warpeshana.

The Ourari is a ligneous twiner; its stem often more than three inches thick, and very crooked: its bark rough, and of a dark greyish colour; the branches thin and inclined to climbing; the leaves dark green, and opposite, ovate, acute, five-nerved and veined; young branches and leaves hirsute; hairs brown; cirrhiferous, however, not peculiar to every branch; fruit of the size of a large apple, round, smooth, bluish-green; seeds embedded in a pulp, and consist chiefly of a gummy matter, which is intensely bitter.

We observed many heaps of the cut wood covered with palm trees which, as the Indians told us, had been left by the Macoosies. The plant grows only in two or three places, which are resorted to by the Indians from all directions, and often from a great distance.*

Before we left the place we cut sticks, and returned by two o'clock, after having been absent eight hours, highly delighted

* A much fuller description of the plant, and the mode of preparing the poison, has been sent to the Linnæan Society.

that, though we could not see the plant in all its stages, we had succeeded in collecting a few of its fruits.

We descended next morning to the savannahs, where every preparation was made to leave the following day for the encampment. We found that the river during our first day's journey had fallen still more, and our difficulties were consequently multiplied. Fortunately, after reaching the encampment, and coming into the vicinity of the northern mountains, late rains had swollen the brooks and increased the mass of water in the Rupunoony: we made, therefore, in one day, with the assistance of the current, as much progress as in two days and a half while ascending.

We halted at a settlement of Warpeshanas, who have built an oblong house a little above the rapids Coura-watoka; the settlement consisted of four men and about twelve women and children. A larger settlement, we were told, is at a short distance from the river. The women were occupied in cleaning cotton from the seeds, and large balls of spun cotton, which were hung up in the hut, proved their industry.

It appears that this is the most northern settlement of the Warpeshanas. Farther north, to the mouth of the Rupunoony, and likewise west, the country is occupied by Macoosies and a very few Caribbees. On the evening of the 1st Jan., 1836, we landed again at the inlet Wey-a-poucari, and proceeded next morning to Pirarara. The inlet Wey-a-poucari, in lat. 3° 38′ N., is the haven of the 'imperial and golden city of Manoa;' a path leads from here to the Macoosie village Pirarara, on the margin of the Amucu, 'the great lake with auriferous banks.' The distance is about eleven miles, leading in the commencement over undulating ground, sparely wooded, and covered with short grass; it traverses then several Eta-swamps, and at the foot of a small elevation, of scarcely more than thirty feet, flows the brook Pirarara, which must be crossed before the village of the same name can be reached. The brook, before it mingles its waters with the Lake Amucu, is scarcely more than three yards wide; that famous lake, the nucleus of the Parima, or White Sea, stretches east and west, and was at the time we visited it, in December and January, scarcely a league long, and almost covered with rushes, showing only from time to time sheets of water. Where the Pirarara issues from it (W.N.W. from the village) it has considerably gained in breadth and depth, and meandering through the savannah, it joins lastly the river Maou, or Mahu.

According to the information which I collected, the latter river has its sources on the northern side of the Pacaraima Mountains, on a table-land, and forms a fine cataract, called the Corona. We were on our way to visit it, when my travelling companion became,

on the third day of our journey, so unwell, that we were obliged to relinquish our purpose and return to the village.

While journeying thither we had to cross the brook Pirarara three times, which, after having turned to all the points of the compass, joins the Maou.

The latter river has waters of a coffee-brown colour, and in its current is more rapid than the Rupunoony. Among the mountains, between which it has forced its course, it is about sixty yards wide, and its valley forms a peculiar mountain scenery, not void of the picturesque, but by no means fertile. It is inhabited by Macoosies. In the month of April the savannahs are inundated, and present then the peculiar feature, that the waters of two rivers belonging to two systems are commingled, and the extent to which the inundation amounts has given rise to the fable of the Lake Parima.

During this period, an inland navigation, entirely by water, may be carried on between Demerara and Para. Several groups of trees, which, during the dry season, rise like oases out of the savannah, form during the inundations small islands; two of those groups are not far from the borders of the lake, which doubtless are the 'Islas Ipomucena' described by Don Antonio Santos. The groups or islets consist of accumulated sand mixed with vegetable earth; the drift matter of the currents during the inundation.

The soil being richer than the surrounding arid savannahs, some seeds may have sprung up; they survived the first overflowings, and became able to withstand the force of the currents, and assisted to form a larger accumulation of detritus and seeds. These hillocks, scarcely raised more than from ten to twelve feet above the savannah, have its peculiar Flora: the *Inga unguis cati*, several *Cassiæ*, large *Cacti* which raise their limbs like gigantic candelabras, and a species of night-blooming *Cereus*, interlacing the trees, formed the chief features. At one of these oases we found several Cashew-trees in full bearing (*Anacardium occidentale*), a most welcome discovery where the water is scarce, and has a pernicious influence besides on the constitution.

The Cana Pirarara has its source one mile east of the village, and within two miles of a branch of the Waaecourou,* a tributary of the Rupunoony, and ultimately of the Essequibo, while the waters of the former flow into the rivers Maou, Tokoto, Branco, Negro, and lastly into the Amazon. The plains between the Branco and Rupunoony have their valleys and alternate slopes, the

* The Waaecourou is generally called Tavaricourou in the late maps, but the first is the name which is given to this brook by the inhabitants of its banks. The Rupunoony is called Rupunuwini, Rupunury, Ruponoony: the Macoosies call it as above; the Caribbees, Opununy, as they find it difficult to pronounce the R.

line of separation of waters being a few miles to the eastward of the village Pirarara, and divides the two basins.

When we passed the Waaecourou in December, its mouth was almost choked with sand, and only a rill of water, scarcely a yard in width, found its way to its recipient; but, during the rainy season, this brook affords the readiest means to reach Pirarara by boating. The site of the Macoosie village is in 3° 34′ North lat., and, according to my chronometer, 16′ 45″ West of Annay, or 58° 53′ West of Greenwich. The north-easterly wind blows here with immense force, and we found the thermometer in the morning of the 26th December as low as 66° Fahr.

Many of the savannahs which we crossed are covered with the fabrics of a species of termites: their nests are pyramidal and fantastic, and from five to ten feet high; they are formed of the ochreous clay of which the savannahs chiefly consist. The insects themselves do not appear to differ, excepting rather smaller, from those which build large nests on the trees, and which are known in the West India Islands by the name of wood-ants: here they are called by the Indians toukousiba. Another kind encrusted the trunks of trees from the base to the branches, giving them an appearance as if they were fringed.

At the village of Pirarara we saw a halè and active man of the age of seventy,—a very rare occurrence: either owing to their wars, or excesses, or may be sickness, we had seen very few elderly men during the time we had passed among them. I had occasion to send a letter to the Portuguese fort San Joaquim, a distance of eighty miles, and this old man was the person who offered to go, and went.

As we were obliged to wait here several days, we decided on an excursion to the mountain valley of the river Maou, or Mahou, in the Parima Mountains.

Provided, therefore, with provisions for some days, we started with Indians as guides and carriers towards the mountains. The brook Pirarara, which has its source to the eastward of the village, flows through the lake which, although it was now the dry season, was three or four miles in extent; the brook takes then an eastern course, crosses the meridian of the lake a second time, and after having wound itself through the low savannah, joins the Maou about ten miles above the junction of that river with the Tokoto. During the rainy season, the lake extends itself from Pirarara to the mountains, as before mentioned, and this is the site of the celebrated Lake Amucu.

Numerous flocks of ducks rose out of the rushes and flew around us in circles; they were mostly of that kind called *vicissi*. The species peculiar to these regions is uncommonly pretty in appearance, their feathers variously coloured, their bill short, eyes

black. The musk-duck (Anas moschatas) frequents likewise the lake in large flocks.

We entered now dry savannahs. On our way we saw numerous cattle: black and red were the most prevailing colours.

These herds of wild cattle appear to frequent only the savannahs south of the Parima Mountains in the vicinity of the rivers Maou, Tokoto, and chiefly Branco, and are undoubtedly of Portuguese origin. Though the savannahs at Annay are connected with those of the Maou, they never descend so far north.

We had to cross the Pirarara for the third time, and saw the mouth of the valley from whence the Maou issues at a few hours' walk before us, when I was so violently attacked by fever that, for the time, it became impossible for me to advance farther. We were then in an open savannah, without a tree to afford shelter; the nearest cluster, which formed one of those spots called 'an island,' being several miles distant and out of our road.

As soon as my attack would permit me, we set off to it. We had taken forcible possession of the abode of numerous birds which had selected this spot for their roosting place. What a noise when they returned in the evening and found us intruders! Pigeons arrived from all quarters, and our Indians, ready with their bows and arrows, prevented many from seeking safety in a rapid retreat.

The mountains of the Parima chain have by no means the imposing character of those of the Conocon. They are seldom higher than from 1800 to 2000 feet, and often only 500 to 600 feet. Many are bare of wood, overgrown with a short kind of grass, and covered with fragments of rock. As far as I could judge of their geological character, they rested on a granitic base, and boulders of the same nature covered their sides. Quartz by no means unfrequently passes into the granite, and occasionally trappean rocks are met with.

The Indians brought me specimens of red rocks, which they consider great curiosities; and which, according to their account, they get five days' journey from Pirarara, at the western mountains of Parime. I consider it a cornelian. Rock crystals are likewise said to be found there. The commandant of Fort San Joaquim said that the Indians from the Upper Branco had brought him at different times specimens of silver.

A bare and rugged mountain was our guide to the Maou. When we approached it I found that it was covered with quartzose fragments, while large boulders of trappean origin gave it a rugged appearance. We followed the brook Samaria, a tributary of the Maou, to the north-east, being often obliged to climb over rocks, and to use the sides of the hills, to avoid the marshy ground. We passed one hill especially where confusion appeared to have selected her seat: thousands of rocks, from the size of an egg to

immense blocks, covered its side, and reminded me forcibly of the Hill St. Bernard's, in the island of Tortola; the rock itself had the same mineralogical character, and even trees and bushes which grow among those rocks at Tortola, I observed here, for the first time. We noticed the *Bursera gummifera,* or turpentine tree of the islands; *Croton balsamiferum, astroites, betulinum; Mimosa nudiflora; Randia aculeata; Cactus Royeni, trigonus; Agave, &c., &c.* I hoped to discover the *Exostemma Caribæum,* which I have generally observed to grow in the company of the above in the Virgin Islands, but hoped in vain.

A singular rock, called by the Macoosies Toupanaghæ, from its resemblance to a hand, attracted our attention. It stood on the top of a mountain on our right side, was deeply furrowed, and had for its base a rock of larger size. The Indians, as is generally the case with phenomena of nature, make it the seat of a demon, and pass it under fear and trembling.

The valley of the river Samaria extends east and west, affording a beautiful view of the western mountains. The Maou crosses the mouth of the valley from north to south.

From this valley we passed to that of the Maou, our course being chiefly north. The mountains had here a slaty texture, showing sometimes veins of quartz; their dip was low, the direction of strata south-west by west.

Being at some distance from the river, which was bordered with trees, its view was still hid from us; but we heard the noise of falling water,—a bed of rocks forming a rapid. On gaining sight of it I was surprised to see a large fine river before me, with black waters and a rapid current; whence I conclude that its sources must be at least in the fourth parallel of latitude.

We had entered a fine amphitheatre of mountains; the small brook Maviesie occupied its eastern, the Maou its western side.

Our Indians had shot a large rattlesnake,—this was the second in the course of the day: gorged with its prey, it was lying inactive under the trunk of an old tree when it was discovered, and killed with a poisoned arrow. The cups of its rattle were seven in number.

We had encamped at the brook Maviesie, in a thicket of trees. Our Indians had told us of a large fall, which the Maou forms a day and a half farther north, and it was our intention to extend our journey so far; but my travelling companion being taken unwell (the prelude to an intermitting fever), we thought it advisable to return to the village as soon as he was strong enough. The Corona of the Maou, as the fall was called, remained therefore unvisited, and, after a day's rest, we broke up our encampment and returned. The Indians had set, previously, the savannahs on fire, and we found the path much more practicable, although the dust of the burnt grass, raised by the wind and our feet, gave us the appearance of coalheavers.

Next day there was to be a great Piwarrie feast in the village: extensive preparations were made for it—the trough filled, cassada bread baked, fish and game barbecued. The guests arrived on the day appointed, and the drinking commenced. It was, however, much more orderly conducted than the drinking match at the Warpeshanas.

In the afternoon they danced; the masters of ceremony, of whom there were two, were adorned with macaw feathers, and had in their hands two large pieces of bamboo, the cavities of which were filled with small pebbles, and the outside surrounded by cotton-hanging and feathers. They walked at the head of the dancing column, stamping at intervals with their bamboos on the ground, by which a rattling noise was caused, women and men accompanying the same by a monotonous song.

They advanced and retreated from the Piwarrie-trough, and went round it stamping with their feet; but as the hands and feet only were in motion, and their faces showed neither expression of enjoyment nor animation, they appeared to me more like automata than human beings.

They continued their dance till two o'clock in the morning, varying the song, which guided their steps, only once or twice.

We quitted Piarara, and returned now towards Annay, and landed at the mouth of that brook on the 15th January, after an absence of six weeks. All the effects which we had left at the settlement we found in the same state as we had left them.

The difficulty of procuring water at our old residence at Annay, and our having been so sickly there during our former stay, and not less the tedious labour of having our effects carried across the savannah, had made us resolve not to return to Annay, and to choose a hut at Currassawaak, Jacobus's old settlement, for our residence during the remainder of our stay in the Rupunoony.

The entrance to our new domicile was disheartening enough: the house, which had been burnt down, and only partially rebuilt, was open to wind and weather in all directions, and it was with some difficulty that we found a tenable place.

THIRD REPORT, *dated George Town, April* 1, 1836.

Our safe return to the Lower Rupunoony, and entrance into the new domicile at Currassawaak, was not to be passed over without some celebration. A Piwarrie feast was resolved upon, but the settlement was in want of a large trough. All the chief men went therefore to the neighbouring wood, and proceeded to select a tree to cut it down, and to hollow it out—partly by the axe, and partly by fire. The appointed day approached, and the trough

was not yet ready; and as the Piwarrie had to ferment for two days before it was to be used, a small coorial was substituted, and the whole settlement, men, women, and children, were seen occupied in chewing the burnt cassada bread, and preparing it for use. After having thus secured its fermenting in due measure and form, and the new trough having been completed on the morning the feast was to take place, the favourite drink was transferred from the coorial into the new harlova, or trough. I have already described the intemperance the Indian is guilty of at his drinking bouts; and the scenes incident to the present were not far different from those of the Warpeshanas and Macoosies.

The chief had shot, during one of his excursions on the Rupunoony, with an arrow provided with a spike poisoned by the woorali, a young female tapir, or mypourie (*Sus rostratus, Tapir Americanus*); and though the point of the arrow had only penetrated the skin, and caused scarcely any loss of blood, it was sufficient to take away life. I was glad to have an opportunity of inspecting this animal, which hitherto I knew only from description and drawings. It was, from the nose to the short tail, five feet long, and nearly three feet high; in its shape it resembled most the hog, with the exception that in proportion it had much shorter legs; on the fore feet it had four toes, and three behind; from the forehead projects a bone, which is connected with the upper lip, forming with the nostrils a kind of proboscis not unlike that of the elephant: the tapir makes, in many respects, a similar use of it. The skin is very thick, and covered with short hair of a dusky grey colour; the ears are small and pointed. In the upper jaw I counted seven incisors on each side, four teeth in front, and two tusks; in the under jaw six incisors, and one tusk on each side. The three kinds of teeth formed an uninterrupted line.

We found its meat uncommonly good, resembling beef; and as it had been shot the day before the Piwarrie feast, it was a most welcome gift to the assembled Indians.

It had been my wish to see the tree which produces the *Caska preciosa* (of the Brazilians), or the amapaima (of the Indians). There were but few trees near Currassawaak, and those at a considerable distance.

I resolved, however, to accompany the chief there, and following the course of the brook upwards in a western direction, we started on our expedition. It was a wild path, if path it could be called. We approached a thicket of wild bamboo (*Nastus*), and while we were still a few yards from it, a large guana snake (*Scytale Spec. ? perhaps Catenatus*) came out of the brushwood and ran towards the brook; it was shot by one of the attendants. Like the guana, it had a pouch under the throat; the mouth was

protected by large plates; the head covered with scales; and the belly and tail with shields,—those on the belly being perfectly formed, while those on the tail were not entire; and there were four rows of small pointed scales, which terminated the tail. Its colour was yellow, with black spots in the form of a lozenge, its length about six feet and a half. On our approach, it coiled its tail, and raised its head to the height of three feet, with a gently trembling motion; it then uncoiled itself, and repeated the same manœuvre in the reverse manner, making its head the point of support, and vibrating its elevated tail: it was in the act of renewing this singular feat when it was shot through the head. It was impossible to induce one of the Indians to carry the snake to our encampment; they evinced the greatest horror at it; and if we are to believe their accounts of frequent accidents, where human life is destroyed by their poisonous fangs, or where the individual survived the venomous bite, that a life of misery was the consequence, we must not be astonished at the horror they display, even when their enemy is lifeless.

Our wish to see the tree which produces the aromatic bark was not gratified. After we had searched for hours at the place where the tree was said to be, the Indians had to acknowledge that they could not find it. I was subsequently fortunate enough to procure at least the bark and leaves, though the tree was at the period in that state so uninteresting to botanists, bearing neither blossom nor fruit. The bark is highly aromatic, and is used by the Indians in dysentery, fluxes, and other similar diseases. I saw likewise the varnish tree, which possesses a milk, which, after being boiled to a consistency, is used to give to their cassada graters and other implements a gloss and more durability; but in this instance I was not more fortunate than with the former. The tree was in its state of rest, and neither in blossom nor covered with fruit: it is from fifty to sixty feet high, its bark rather grey, and the leaves resemble most those of the amyris.*

While we followed our different pursuits, dissension, caused by jealousy, had broken out amongst our Indian community, and it required all our chief's tact to soothe the offended husband, and to prevent murder.

The greatest proprietor of provision-grounds at the Currassa waak was an old Macoosie woman, who, in consequence of having lost her husband at the settlement, did not reside permanently at Currassawaak, but came only from time to time to convert the root of the cassada into bread, and to carry the other ripe productions of her field to her present habitation at Annay.

* I collected specimens of leaves, and of the bark from both trees; and have sent them, with exception of the bark of the varnish-tree, lost at the Falls, to the Horticultural Society of London.

While we were encamped here, she came twice for that purpose, accompanied by her daughters, young women, and her grand-children. She commanded over the whole settlement; every one appeared to be subservient to her, and, what was a riddle to us, the Caribbees even submitted to her orders. She possessed, likewise, a field planted with sugar-cane; and as many months had elapsed since sugar had sweetened our coffee, we resolved to build an Indian sugar-mill, and to buy from her the canes then on the field. By the mechanical skill of one of our party, we soon had a mill erected; and our Indians were busily employed in pressing out the juice of the cane, which was converted into syrup, and next morning's coffee was sweetened. Trifling as the circumstance may appear, it was to us a novelty, and we had only to regret that our canes gave out so soon; nevertheless, we reserved a couple of bottles of syrup to carry with us whenever we were to depart from Currassawaak.

Our Indians having procured themselves, during the period of the intercourse we had with them, all the necessaries they stood in need of, they relapsed into their old indolence: neither knives, nor combs, nor scissors—for which they would have sold their birthright when we first arrived—could now induce them to leave their hammocks. The neighbouring brook was full of fish; nevertheless they satisfied themselves with cassada bread and pepper water rather than give themselves the trouble to angle for fish. It need not be mentioned that our table was in consequence but poorly served; and we had to depend entirely upon our success in fishing and hunting. We learned, however, from the old Macoosie woman a method of catching a number of fish without much trouble. The brook Currassawaak was on a low level, and we observed that she had her coorial drawn across the brook, and closed every opening still left, with rocks and dry branches. The place selected for that purpose was where the brook widened farther upwards. The fish, on their passage downwards, finding the communication stopped, attempted to jump over the impediment laid in their way, but failing, they fell into the coorial. We followed the same plan, and found, generally in the morning, from fifty to seventy fish of different sizes in our boat—which we had barbecued and salted, to serve in days of want. The low state of the brook, however, soon put an end to our fishing in this mode.

Our departure from Currassawaak approached now daily; in every hut were preparations made for it: a new life appeared to reign throughout the settlement; every one appeared to rejoice in the idea of visiting George Town; from morning to night cakes were baked out of the flour of the cassada, or the flour packed into baskets to last for the journey. To us the stay at Currassawaak became irksome; legions of chigoes, and their next of kindred,

fleas, had taken possession of our hut, and the first plagued us to such a degree, that we really feared they would completely ruin our feet. Not satisfied with penetrating under the nails of our feet, they attacked likewise our hands, and buried themselves during night under the finger-nails: indeed we enjoyed but little rest. The scarcity of provisions was another reason why we hurried our departure.

From numerous inquiries which we had made among the Indians, we had to expect the rainy season in two moons. We thought, therefore, if we departed towards the end of February, we should be in George Town by the period the rains commenced. On the 20th of that month the wind became N.W., and was accompanied by distant thunder; the appearance of the sky was changed, and it was covered with heavy clouds of a dark grey colour; the thermometer was seldom more than 80° Fahr. However, there was no rain as yet, and the generality of our Indians maintained still that two moons would have to elapse before the rain set in; only an old Caribbee was of a different opinion. He told us that we might soon expect it, and gave us a reason for his opinion, that the young turtles were so far advanced towards perfection that the rain might set in in the course of a week. He was correct in his conjecture, and we had only to regret that we did not consult him previously. Admirable provision of Nature, that had taught these animals to watch the seasons, and to deposit their eggs time enough to enable the sun to hatch them! There are chiefly two species of turtle which frequent the Rupunoony and Upper Essequibo: the *Emys tricarinata,* called by the Indians casseepan; and another species, perhaps of the same genus, which the Indians call tarakayba. There is a third species of fresh-water turtle, which, however, is scarce in the Rupunoony; it is the *Matamata,* or *Chelys fimbriata* of authors; the latter is about two feet long, the nose terminates in a kind of proboscis, the feet are webbed, five toes before, and four behind, are armed with claws, and the short tail is rather rounded.

The large head and the elongated nose give to this species quite a peculiar appearance; its flesh is as delicate as that of the other fresh-water turtle. The eggs of the two first species are gathered by the Indians in large quantities in the months of February and March. They are different in form: those of the first are almost perfectly round, and the calcareous shell resembles parchment; while those of the second, smaller in size, and of an oblong shape, might be taken for birds' eggs. The eggs of the tarakayba are more delicate than those of the casseepan; they are deposited generally in holes, the number of eggs contained in them amounting to from sixteen to twenty. The Indians undertake large expeditions to the river Rewa, where they appear to be more nume-

rous than either in the Rupunoony or Essequibo. I witnessed the return of one of these expeditions; the boats were loaded with eggs; those collected during the last two days of their excursion were in a fresh state, the others barbecued. When barbecued they lose the albumen, and it is only the yelk which is rendered hard by this process; they are by no means to be rejected when in that state.

Several Indians in the neighbourhood purposed taking advantage of our departure for George Town, and requested that they might be allowed to travel in our company.

The Indian always prefers to travel in large numbers; his dread of evil spirits is so great, that he will subject himself to great inconvenience rather than travel alone. On the 26th of February we left, therefore, the mouth of the Currassawaak in eight boats, containing upwards of eighty persons. The weather had been unfavourable for the three days previous, and we set out under rain: as long as the rain does not descend in torrents, the Caribbee laughs at it, and increases his 'paddling.' Should his riches amount to the possession of a shirt, on the approach of rain it is immediately pulled off and secured in a dry place, unless perhaps his wife is sitting shivering next to him, when it is surrendered to her to put over her head and shoulders. She does not make further use of it, and must consider the wearing of a shirt quite unnecessary, since I have never observed an Indian woman from the regions south of the confluence of the Rupunoony with the Essequibo wear that article of dress.

It was my purpose to ascend the Essequibo for several days' journey from the point where it received the waters of the Rupunoony. The Indians, with whom I had much intercourse, had told me frequently of a great cataract, which they said stopped all farther advance in boats. They had received those accounts from their fathers: all my endeavours to find a person who had been there were in vain; the greatest extent of their advance was the inlet Primoss, from whence a path led to the river Courantin, and which inlet is not more than two days' journey from the embouchure of the Rupunoony, where we arrived on the 27th of February.

The junction of the Rupunoony with the Essequibo is in 3° 57½' N. lat., and 58° 3' W. long., as deduced from my observations at Annay, and is almost in the same meridian with its sources, describing in its course a semicircle. Numerous inlets, or kirahaghs as they are called, and which are so stocked with fish as to form natural reservoirs of the finny tribe, are almost peculiar to it; though the Essequibo has some also. What may have caused these inlets is not so evident: if they were in the direction of the current, it might be explained; but they are mostly against the

current, and the uninterrupted line of the river's banks prevents my supposing them to be old channels: the greatest probability is, that they have been formed during the inundations. They are at their mouth often wider than the river itself, and a stranger may easily suppose the inlet to be a continuation of the river, if the currentless motion of the water did not undeceive him.

The banks of the Rupunoony, with only a few exceptions, are as sterile as the adjacent savannahs; they consist of an ochrous clay, and it appears that even the annual inundations do not improve them.

We formed at the confluence an encampment, where we left women, children, dogs, parrots, &c.; indeed almost a menagerie. In the course of the following day, the necessary preparations were made for our further advance, the most effective crew selected for the swiftest of our coorials, and we put only such articles on board as were indispensable. While thus occupied, a flock of trumpeters (*Psophea crepitans*) flew over the Essequibo; they must have had a far journey: three were unable to cross the river, and fell into the water. Two coorials went in chase of them immediately, and they were soon secured by the Indians: they are beautiful birds, but too well known to need farther description. The Indians call them Waracaba. We proceeded on our ascent of the Upper Essequibo on the 29th February, though the indications of the weather were by no means favourable; we became now well aware that the rainy season had set in; the sky was constantly covered. The black waters of the Essequibo were, nevertheless, a welcome sight: how much we did enjoy their freshness! indeed we were persuaded that they were more wholesome than those of the white Rupunoony. The vegetation of its banks was more luxuriant; the width of the river was upwards of 350 yards; it took a much straighter course, and meandered by no means in such short turns as the Rupunoony. The river, tracing it upwards, had almost an easterly course, for eight miles, not far from the junction with its affluent, there was formerly (according to Indian testimony) a post on the Essequibo's left bank, to prevent the Caribbees from descending the river for the purpose of making, or dealing in, slaves: though it stopped their proceedings for a short while, they soon found a way to avoid the post, and selected for that purpose the path at the inlet Primoss; the postholder was therefore recalled, and the buildings decayed.*

* It is not generally known that the Dutch had extended their posts so far south but several Indians assured me that they recollected their fathers had told them that such was the case, and adduced as further proof that Mahanarva's brother had taken away the canons and carried them to his settlement further south. We passed the site of that settlement next morning; its former possessor appears likewise to have been more advanced in civilization than the generality of his tribe. He had passed part of his life at the colony, and possessed himself there of the English and Creole languages. As his nephew Jacobus, or Thryee, assured us, one of the canons was still to be seen; the others had sunk.

The streamlet Acajou is the outflow of an inlet of some extent which runs parallel with the river; it is said to be inhabited by the crocodile of the Orinoco. Highest up we found the Essequibo impeded by rocks, apparently stratified, running N.W. and S.E.: a Caribbee settlement, Musaro, was formerly here, but, like many others, its inhabitants had mostly died, and the rest removed.

At the rock, called by the Indians Toumounæ, or White Head, the river flowing from the south is turned abruptly west, which course it holds to its junction with the Rupunoony. Drenched with the almost incessant rain, we took up our night's quarters at the inlet Masaeta-yourou. The comforts we met there, with the rain descending the greatest part of the night, may be imagined; our journey was commenced under no better auspices next morning. We passed in the course of the day several abandoned settlements. The vegetation of these places being less dense, and a number of trumpet-trees (*Cecropia peltata*) announced generally their having been inhabited. The frequency of these abandoned places, formerly inhabited by Caribbees, prove how numerous their tribe must have been even at the close of the last century. A path led formerly from the mouth of the inlet Primoss to the river Courantin. An Indian named Dabaero told us that his grandfather had been settled here. We found a lime-tree in bearing, and a number of cocoa-trees, hog-plums, &c., proved that its former possessor had, unlike the Indian in general, planted and raised useful trees, which said much for his character.

We reached next morning the island Pahumpo, where Mahanarva, who appears to have been of most migratory habits, likewise resided for some time.

The Essequibo had received but few tributary streams lately; we were, therefore, rather surprised when we observed on its left bank a river flowing into it from the south-west, the largest we had seen since we left the Rupunoony: our Indians were entirely unacquainted with its existence and its name. I called it, therefore, Smyth's River, in honour of Major-General Sir James Carmichael Smyth, Bart., Lieutenant-Governor of British Guayana, who has taken great interest in advancing the present expedition. In the afternoon we arrived at a point where the river is narrowed on its right shore by a sand-bank, and on its left by rocks; it was here not more than eighty yards wide, while a little above it widened again to its general breadth of about 300 yards. The banks of the river had still the same luxuriant appearance as the Lower Essequibo, so different from the dreary banks of the Rupununy.

The mora-trees were in blossom, and the white flowers formed a pretty contrast with the dark green leaves; the branching oubondi, or wild cashew-tree, vied in height with the mora, and

numerous monkeys jumped from branch to branch, and, astonished at the uncommon visit, accompanied us for a considerable distance. Our Caribbees called this species arieghi, or yahriæ; the male has straight long hair of a shining black, the head rather round, the forehead and part of the face and neck covered with short, yellowish hair, part of the front, the nose, and mouth black, the latter slightly bearded, hands black, nails claw-like, except the thumb. The female is different in colour, and her fur resembles that of the European hare; her hands are likewise black, and covered with short yellowish hair, from under the eyes to the chin extends hair of a similar colour, but somewhat larger than those of the front and cheeks, the breast is nearly naked, and the oshyoides visible. They jumped with great agility from tree to tree, the female and sometimes the male carrying the young ones upon the back. The length of the body is sixteen inches, that of the tail sixteen to sixteen inches and a half, their height about ten and a half to eleven inches. In their general aspect they resemble the squirrel.

On our further ascent of the river we observed rising ground, and the smaller rapids became more frequent; the river here made another sudden bend to the north-west almost at right angles to its former course, and its bend forms a wide basin. Numerous rocks obstructed its course, and towards the south we discovered a hill about 500 feet high, bearing then S. 18 W.; opposite to an island a number of wedge-shaped rocks were peculiarly ranged, presenting their edges to the E.N.E. The river exhibited quite the appearance of its lower region, studded with small islands, consisting of a confused mass of rocks between which some soil had collected: the rock Guava, a species of capparis, and some grasses formed generally their vegetation. Between the rocks subjected to the flow of water grew the smaller weya, *Lacis dichotoma* (*mihi*), and we were not long among them before the Indians shot the first pacou. Every object reminded us of the lower falls, with which the present measured themselves in height and extent. The scenery around was highly romantic, and the cheering cry of our Indians while drawing the boats over them, gave an animation to it quite unknown in these uninhabited regions.

The existence of these falls removed some of our doubts with regard to the larger fall. We were told by some of the Indians who had this information from Mahanarva, that we should have to pass a series of smaller falls before we reached the larger. By night, some of the fallen leaves on the ground appeared to be covered with a phosphoric light; their number had considerably increased during the last night. I had never observed this phosphorescence before, and I ascribed it to a cryptogamous plant called forth by the incessant rains. The ground about our tent

was quite illuminated; not only leaves, but likewise smaller branches which lay on the ground, exhibited the whitish light. But this was not the only wonderful production of the rain; the latter had loosened the tongues of all the frog-kind in the vicinity, and to judge from the variety of their cries, the species were numerous. The cry of some resembled the bleating of calves, others, the chirping of birds, the call of the duck, and even the hoarse voice of man to a considerable degree; but the most remarkable among the strange crew was 'the paddler,' whose quacking voice resembled so much the regular stroke of a paddle, that it deceived one of our party entirely, when he heard it for the first time at the Essequibo Post. For several mornings he told us that he had heard a boat passing. The post-holder was astonished that neither he nor his watchman should have heard it; and the latter received a severe reprimand for neglect of duty. The frequency of boats passing, however, cleared up the mistake, and it proved to be 'the paddler,' as we thenceforth called the frog. It lives on the land, and, as I am informed, is nearly the size of the rana paradoxa: it has long yellowish legs, a brown body, spotted with black; and its abode is generally an old tree, until the night invites him to his ramble, and exercise of vocal power.

While we turned suddenly round a point next morning, we observed on the opposite shore, on some large rocks a jaguar (*Felis onca*), he was sitting on his hind legs like a dog, and looked calmly at our approach, until the foremost coorial was within the distance of about fifty feet, when he left slowly his seat, and retired to the woods: it was the first I had seen during my expedition. The rapids became more frequent, and the ascent fatiguing to our crew, Hillocks of the height of about 200 feet, wooded at their base, and grown over with grass above, surrounded the rapids as an amphitheatre. They were mostly of a conical form, and showed on their sides, walls of granite of at least fifty to sixty feet perpendicular height. Two remarkable hillocks were at some distance from the river's right bank, and perhaps 500 feet high; smaller hillocks stretched to the very edge of the water. While passing them, quite a peculiar cry resounded from the high trees; it was almost startling, and arose from a species of monkey, which the Indians called 'quatta,' and which is related to the howlers.

We breakfasted on an island almost covered with the corró-va palm; I admired again its beauty: in its leaves and general appearance resembling the cocoa-nut-tree, which it surpasses in its growth and mighty pinions, to which the beautiful formed leaves might be compared. One was in fruit, and as there were so many, I did not hesitate to have it cut down, in order to procure some: they are not eatable, but they may serve to establish its scientific name, if the species has been described before. I found, like-

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wise, two or three specimens of the 'oubatee' of the Warpeshanas, a proof that this species of palm does not confine higher regions.

On the evening of the 4th March, we bivouacked within a mile of the great cataract. Dabaero, who was the only Indian, not only of our crew, but of the whole neighbourhood of Annay, who pretended to have visited it in his boyhood, and to whom we had put a thousand questions with regard to its distance and situation, became at last quite confused; and, even now, when it was evident that some great fall was before us, he was not certain whether it really was the place we were in search of. Shortly after our landing, and having our temporary huts erected, a severe thunder-storm commenced, and the rain, which set in with it, continued the whole night.

The river contracted considerably: the hills approached each other from both sides, and the indentations of the opposite shores were so exactly matched, that the channel appeared to have been the work of art. The weather, as if to reward us for the sufferings it had caused us during the last few days, cleared partly up; the mist hovering still around the tops of the hills, and the sun venturing a few stray beams through the dark clouds, cast a varied light over the landscape, which rendered it still more picturesque.

A quarter of an hour's paddling, on the morning of the 5th of March, and the great cataract of the Essequibo, was before us. Numerous conical hills of granitic structure, and about 300 feet in height, covered with luxuriant verdure, narrow the river to within fifty yards, where the whole body of water dashes down a precipice of fourteen feet, then foams over a rugged bed of rocks for about twenty yards, and again precipitates itself, ten feet, to the basin below,—the rich vegetation luxuriating in all the fertility of a tropical clime,—the masses of granite projecting into the river, and hemming it in to its narrow limits; and the foaming waters in the background bearing away everything opposed to its progress, combined to form the most beautiful and picturesque scene we had witnessed during the course of our expedition.

As all the Indians of our party agreed in declaring that no white men had ever before reached this fall, and as from every inquiry I made, I could obtain no native name for it, I considered myself justified in naming it King William's Cataract, in honour of his Majesty, the patron of the Royal Geographical Society; and accordingly we went through all the established forms of naming it, much to the surprise and amusement of our Indians.

The chain of hills through which the Essequibo here forces its passage, appears to be a continuation of the Taripona Range from the westward; it does not exceed 500 feet.

We ventured with our canoe as near to the fall as we could with

safety, then climbed the rocks at the lower fall, putting to flight some thousands of swallows (*Hirundo melba* probably, with a white ring about its neck). We afterwards scrambled with some difficulty up the rocks by the side of the upper fall, whence, looking to the southward, we saw the river flowing from the south-west, still contracted within its narrow limits, and forming a series of rapids. The water was now only a foot above its lowest level; yet it was not possible, provided as we were, to drag even the lightest coorial over the fall. The projecting masses of rock could not be reached to obtain a footing for the Indians.

The only way to continue the ascent of the Essequibo would be to form an encampment on the eastern bank, and construct a path over the hills, and thus transport the baggage, &c., to the upper stream; but this the rainy season forbade, even if our health and strength had permitted our further progress. We were obliged then to be satisfied with the information we could glean from the Indians of the river's course. They stated that the stream from its source was but small, till the waters spread out into a large lake; but, on issuing from this lake, the river was of some considerable width, which it maintains till it reaches the cataract. The grandfather of our chief, Jacobus, had been settled near the outlet of this lake: and Mahanarva, the last Cacique of the Indians, is said to have dwelt near it. Marvellous stories also were told of the lake, as the abode of an evil spirit in the form of a serpent, &c. &c. Having accomplished all that we had in our power to do, we buried a bottle recording the date of our visit, &c., and bent our course down the stream.

Halted for the night at one mile N. 28° E. of the fall, where a satisfactory meridian altitude of Canopus gave me 3° 14½′ N. as the latitude of the cataract, and 57° 43′ longitude W. of Greenwich, deduced from my lunar distances at Annay. Before the moon rose the rain descended in torrents, and prevented my obtaining sights for longitude here.

March 7.—Continued heavy rain—descended the river rapidly till we reached the lesser falls, seven miles to the north of the cataract. As our Indians could give us no name for them, I ventured to call them after Sir George Murray, who was president of the Geographical Society when this expedition was planned. A few miles further, and we again reached the mouth of Smyth's River.

In consequence of the rain, the river had risen considerably. While ascending, we breakfasted at a place where a ledge of rocks, connected with the shore, stretched for a considerable distance into the river, we proposed making a similar use of it on our return, but found the rocks covered with water: upon a moderate estimate it must have risen nine inches in seventy-two hours. The increased current also had commenced to undermine the banks.

Within a hundred yards of us we saw a tree tottering, and immediately afterwards it fell with a tremendous crash into the river; all the minor branches broke into pieces as soon as the tree touched the surface of the water, and were immediately swept away by the current.

We encamped this night at the inlet Primoss, in order to examine the path which was said to lead to the rivers Demerara and Courantin. The path was grown over by woods, and scarcely a vestige of it to be discovered: and after we had wandered about for several hours, we arrived at a swamp of briars and prickly palm. Our guides now acknowledged themselves to be at fault, and the rain still descending in torrents, we gladly traced our way back to the encampment.

The Indians had walked that path in their youth, when it was much frequented by the tribes then inhabiting the banks of both rivers. This intercourse had ceased gradually, and stopped entirely when the Caribbees between the Rupunoony and the cataract of the Essequibo had most of them died, and the rest removed. We did not make any further attempt; the most unfavourable weather, and the inefficiency of the crew, who, like ourselves, suffered from swelling of the feet, made every pedestrian tour precarious.

I understood from Dabaero, a Caribbee, and the veteran of our Indians, that, from the inlet, it is a day's walk (about fifteen miles), to the brook Tokoutou, on the banks of which the travelling parties formerly took their night-quarters, and reached, next morning, after three hours walk, the Demerara River, which is only a few yards wide, where the path formerly crossed it; and which, according to his information, has its sources in a cluster of wallaba bushes (*Panzera* and *Dimorpha*), about twelve miles to the southward. From this point the Indians pursued their way, and reached the Courantin generally on the third day.

While penetrating through the woods in search of the path, we saw numerous cocoa-trees (*Theobroma cacoa*) loaded with fruit in all stages; they even extended more than a mile from the river's bank, and though they were overshaded by larger trees, they had reached, nevertheless, a height of from thirty to forty feet; and the luxuriant growth, and numerous fruit, proved that the plant was satisfied with the soil. It is not to be doubted that the trees were originally planted by the Indians; but from their number, and distance from the river, I judged that they were propagated by animals. When the fruit has reached its maturity, it falls to the ground, and is eagerly sought by the peccary, or bush-hog (*Dicotyles*). The forest-trees consisted chiefly of crab-wood (Aublet's *Carapa guianensis*), the fruit of which covered the ground. The Indians press an oil out of the nut, which burns very well, but it is generally used for anointing the hair. The Indian women, so

famed for the beauty of their hair, and its peculiar gloss, make constant use of it: when setting out on a journey, a gourd filled with crab oil is sure to form part of the baggage.

They have found means at the colony to deprive it of its peculiar smell, and it is now to be found on the toilette of many a fair Creole, or European. In our progress through the woods, we found a remarkable tree, called by the Caribbees, mussara: its base like the mora and silk-cotton tree, had not only excrescences, but the whole tree (five to six feet in diameter), and perhaps fifty feet high before it divided in branches, was entirely fluted, as if it consisted of the trunks of numerous more slender trees. A passion-flower which slung itself around it attracted my attention; its ligneous stem was, at the base, twice the thickness of a man's arm, and its beautiful flowers, outside scarlet, and inside dark blue, were arranged in clusters, and grew out of the stem, but a short distance from the ground. Within twenty feet of its roots there were no leaves, and being unable to climb the tree in consequence of my swollen feet, I was prevented examining them nearer; they were, however, ovate, appeared to be rough, and resembled most those of passiflora quadrangularis; also green-heart, one of the finest timber trees; the costly letter wood, the bourracourra of the Indians; and the houcouya, or iron-wood, are all found here.

We returned now to our encampment at the mouth of the Rupunoony, where we found everything in good order: and after we had embarked our baggage, we left the Rupunoony on the 9th of March on our final departure to the coast. A few hours afterwards we met a numerous party of Accaways in seven coorials and woodskins; their cassada crop being exhausted at home, it was their purpose to pay a long visit to the Macoosies of the Parima Mountains, until such time as they thought their cassada fields would be fit for crop. They had their boats loaded with sugar-cane, fish, and game; but they had neither a morsel of cassada bread, nor a yam, nor a sweet potato. We had plenty of the first, and being in want of fish and game, we bartered for the latter, giving in exchange bread, knives, and hooks.

We visited the abandoned Caribbee settlement Mourre-mourre-patee, famed on the high-road of the Essequibo for the large quantity of sugar-canes which grow there, it might be said, almost wild. The settlement belonged formerly to our friend Jacobus, and, as he told us, his stay there was only for two years, being so unfortunate as to lose several of his people by sickness; and though more civilized than the rest, he could not divest himself of the superstitions of his tribe, which were planted in him from childhood; he left it, therefore, when the new settlement was just about to become productive. The sugar-cane had grown up without cul-

tivation, and, though many years had elapsed, we found it of a size equal to any in the colony, and particularly sweet; the spare places of our coorials were soon loaded with it. We found that the Accaways which we met the previous morning had been encamped here for several days; a newly-dug grave under a shed told us that they had left one of their number in the place.

Many of the Indian tribes, but chiefly the Caribbees, Macoosies, and Accaways have the custom of burying their dead either in the hut where they lived, or, if a case of death should happen during a journey, a shed covered with palm-leaves is built over the grave, to prevent the weather from incommoding the person who rests beneath.

We passed Achra-moucra, the place of those piles of granitic rocks on which, in our ascent, we looked with admiration, mixed with awe. In consequence of our visit to Mourre-mourre-patee, our captain chose a different way, with the intention of gaining the common channel by one of the passages formed between two islands. We found, to our regret, that one of those giants of the forest, a mora-tree, had lately fallen across the passage, and made every further advance in that direction impossible. It would have taken us half a day to return by the way we came, until we met the navigable channel; our captain resolved, therefore, to force a passage through unfrequented channels,—an undertaking most laborious, and threatening destruction to our coorials at once. We travelled thus more than three to four miles between numerous dykes of rocks, and islands of every form and shape, the current being divided by them into numberless rapids. Many of the rocks were covered with lichen, parasitic plants, and a coarse grass; some of them exhibited even bushes, or a balsam-tree (*Clusia sp.*), covered with its beautiful wax-like flowers. We arrived at the fall of Ouropocary on the 11th of March; here we had again to unload our boats, and to carry the luggage across the small island, on which we observed the remarkable rock resembling Gothic spires, described on our ascent. All the boats reached safely the foot of the falls, but there were moments of deep anxiety, while standing ashore, from the moment I saw the boat swept forward by the upper current until it had reached the foot of the falls, winding itself through the sinuosities of the rapids, and avoiding the dangers which pointed rocks opposed from both sides.

We observed some mountains on the eastern shore of the river, which have received their name from a rivulet that flows at their foot, and which is of such a blackness that the Indians have named it Siroppa Creek, resembling the syrup of sugar in colour, but not in sweetness. The Indian is never at a loss for an appropriate name; it is likely that they only became acquainted with

that rivulet after the first settlers had arrived and cultivated the sugar-cane. They saw the syrup, and finding that the sluggish waters of the brook had the same colour, they attached a vowel to the foreign word and Indianized it.

Several of our utensils, new to them, were thus named; the frying-pan, a useful article in order to bake cakes of the pouroumoh or cassada flour, reminding them in its form of the Sting-ray, received its name Ceepari.

The contrary accounts which I had heard of the river Bourre-Bourre, an affluent of the Siparoony, made me resolve to ascend the latter until I met the mouth of its tributary.

The weather became worse daily, the thermometer stood generally at sun-rise at 72° Fahr., and seldom reached 80° during the warmest part of the day: the rain fell in torrents. Our situation was rendered most unpleasant. Wet to the skin, we had no sun to dry our clothes; it was worse with regard to our night quarters; our curtains having sundry openings, did not keep the rain out; and the huts which our Indians built and covered with palm-leaves, stood very well a moderate shower, but not a tropical torrent; and, in spite of fires which we kindled under our hammocks, we were not able to warm ourselves, and we passed frequently the greater part of the night by walking up and down. The river swelled daily, and by the time we reached the Siparoony, it grew from eight to nine inches every day. In consequence of its fullness our Indians failed in catching fish, and the rain preventing them from hunting, we had to live solely upon cassada bread from the time we passed the falls of Rappoo to our arrival among the coloured people of the Essequibo.

We left the greater part of our crew at the mouth of the Siparoony, and as the day was not yet far advanced, we took one of the smaller coorials in order to reach the Bourre-Bourre. The waters of that river have a reddish colour; its banks are skirted by high trees, among which we distinguished the timber wallaba (*Dimorpha sp.*) in large numbers; the soil appeared more fertile than even that of the Essequibo. The same granitic dyke which crosses the latter river at Ouropocaro impedes likewise the Siparoony, within a few miles of its mouth. We found them very difficult to ascend, and had to cut a channel through the bushes which overhung the river, which was full to overflowing. After an hour's hard work, the rain descending in torrents all the time, we reached the head of the fall.

The solitude which prevailed here caused almost an oppressive feeling; the narrowness of the river, which was only 150 yards wide at its union, had become much narrower; the dense foliage of the trees and bushes which skirted its banks, and a temporary calm after the severe shower, all united to make us fancy

nature was asleep: the tap of the woodpecker, resounding like the heavy fall of the axe through the woods, was really a relief, and gave new matter to conversation between my companion and myself; indeed it is astonishing what a loud sound the larger species (*Picus multicolor*) produces; one would think it impossible that it could come from a bird. The bird itself is elegant in appearance, the dark colours of its body contrast strongly with the orange of its head and neck. We reached the mouth of the Bourre-Bourre next morning. The two rivers appear here of equal width and of similar colour; the Siparoony coming from the west, the Bourre-Bourre from the south-south-west; their width amounting to about seventy yards. Not far from their union they emerge from a chain of mountains, and, to judge from the information I was able to collect at Annay and Pirarara, they have their sources at the western angle of the Pacarayma, or Parima Mountains; we followed the Bourre-Bourre for some distance, but as there were rapids before us, which we did not wish to ascend, we returned towards our encampment.

The acuteness of the Indians in discovering the guana (*Iguana delicatissima*); though hid partly among the thick foliage of the bushes, is really surprising. While following the course of the river the current carried us often with the greatest swiftness, nevertheless, our Caribbees discovered the poor guana while feeding on the leaves of a favourite tree, a species of mimosa, or lurking for insects. The discovery of a gold mine could not have caused more joy to our crew: the bow-string was quickly fastened, and the arrow, properly directed, seldom missed its aim; but it often happened that the animal, with the arrow fixed in its body, dropped into the water and sunk before the Indian had time to jump overboard, and with it the hope of a delicate morsel and the arrow besides were lost. This guana-hunting took up a good deal of time, and I had given strict orders that none but the hunting-boat should stop for the purpose of shooting them; however, our scarcity made me repeal my former order, unfortunately without the desired effect. The guanas appeared to be in league with the finny tribe; all our endeavours to procure either the one or the other were in vain.

The following evening we observed some moving objects on a sandy beach at a good distance from us; every one in the boat was of opinion that they were men, and, from their being dressed in white, we concluded that they were coloured people from the Essequibo on a fishing expedition.

The Accaways, which the reader will recollect we met not far from the mouth of the Rupunoony, had told us of an epidemic disease which had broken out in the colony, and was said to have committed great ravages among whites, coloured, and Indians;

we were, therefore, doubly anxious for news. Our crew seemed to understand our feeling, and with redoubled swiftness resounded the stroke of the paddle. We approached the beach, but who can depict our disappointment when, in lieu of human creatures, we found three jabirus (*Mycteria Americanus*) pacing leisurely up and down! The disappointment was too severe to be laughed at: besides the information which we were so anxious to receive, we flattered ourselves that we should be able to procure some provisions from the new-comers. The jabirus might have discovered our half-starving faces and our sinister intentions on their lives; they took to their wings before we came within gun-shot, and thus another disappointment was added to the former. This large bird, which is often six feet high, resembles our stork, but its bill is bent upwards. We saw them in numerous flocks on the savannahs near the Parima Mountains, and met them in threes and fours on the sandy beaches of the Rupunoony and Essequibo. Their measured step and upright bearing had frequently amused my military companion, who was forcibly reminded of the parade, so that he could not refrain, while passing the beach, from giving to these feathered recruits the word of command, and they ever afterwards, among ourselves, went by the name of his recruits.

We met next day two woodskins* with Macoosie Indians on their return from a visit to Berbice. They had left the Demerary River the previous day, and passed one night on the route, from which we may calculate that that river is about twenty miles from the Essequibo, where the path meets the latter river opposite the Commoutie Mountains. On their descent they hide their craft at that point, and walk to one of the Indian settlements on the Demerary River, and thence to the Berbice, which they reach in three or four days from the time they leave the Essequibo.

We passed next day the Twasinkie Mountains, and by means of a lateral channel avoided its large cataract Encourite, or Cumaka-toto, where we lost our letters, newspapers, and provisions.

In order to avoid a dangerous fall, called by the Caribbees Apou-coyahan, Jacobus chose one of the by-ways which the numerous islands afforded. We soon observed that our leader was a stranger to it, we nevertheless continued, as we judged from the strong current that there must be an outflow: we saw some rapids before us, but as the water did not present any dangerous appearance, we put the coorial in the current, and with the rapidity of lightning we were carried towards the descent, which, to our greatest surprise, we discovered, now too late, to be at least six feet perpendicular. There was no retreat, nothing could have

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* Woodskins is the literal translation of the Indian name for a small canoe made entirely of the bark of a tree.

stopped the boat, and the next moment would decide our fate; the silence of the grave reigned now in our coorial; the few orders necessary in such a case had been given by Jacobus in a decisive manner, and upon the Ruler above depended the rest. We arrived at the brink; carried forward with still redoubled impulse, she took the fall, and skipping over the void, buried her bow in the surge at its foot, and rising above the foaming waters, she obeyed again the steady hand of the helmsman; a simultaneous burst of joy arose from the crew of our coorial. The other craft of which our squadron was composed did not think it expedient to follow the commodore, and thus we were separated for the day.

Among the Indians who requested to travel in our company when we left Currassawaak was James, the chief of the Macoosie settlements at Warapoota. Scarcity of provisions, and still more the dreaded revenge of a tribe of Accaways to whom he had given provocation, induced him to make a trip to the 'Macoosie country,' as the district about the Parima Mountains is generally called. He returned now with his wife and followers in a large canoe and a coorial. While we ascended the Essequibo and Siparoony he had slowly proceeded, and on our arrival at the first settlement above Warapoota we met with him, he having arrived the day previously. The rain prevented our proceeding after mid-day, we were, therefore, glad to have an excuse for stopping, the more so as the Indian hut promised us shelter against the pelting rain and a few hours' sound sleep: how the latter was effected remains a riddle to me; the combined crews of 'Macoosie James' and our coorials amounted to upwards of fifty men, and a numerous pack of quarrelling dogs, and screeching parrots; then came the cudgel of the enraged Indian distributing merciless blows on the poor brutes, who howling fled for shelter to the adjacent woods.

We parted next morning from 'Macoosie James,' who was to return to his settlement at Warapoota.

The rapids of that name were safely passed, and directing the other canoes to proceed, my companion and I went to the foot of the large fall which we had avoided by a lateral channel. It is not only famed for its own grandeur, but likewise for a number of figures which the Indians have cut into the rocks that form a small island at its foot. The rocks which bear inscriptions are very numerous; these rude figures resemble those which I had seen in St. John's, one of the Virgin Isles, which doubtless are the work of the Caribs, who formerly inhabited that island. We had looked in vain for inscriptions which, according to Humboldt, Hortsman had discovered on the banks of the Rupunoony, and I was therefore happy to see those just alluded to. I was most anxious to carry part of one of the rocks which bore inscriptions with me, but, weakened as I was by fever, the blows of a large

axe were not sufficient to break the hard rock,* and neither threats nor promises could induce any of our Indians to strike a blow against these monuments of their ancestors' skill and superiority. They ascribe them to the Great Spirit, and their existence was known to all the tribes we met with. The greatest uneasiness was depicted upon the faces of our poor crew; in the very abode of the spirits, they momentarily expected to see fire descend to punish our temerity. As we could not succeed in breaking one of the rocks, I was obliged to satisfy myself with taking an accurate drawing of the most remarkable ones.

We were rather surprised, in looking back, to observe that 'Macoosie James' was following us: he had expressly told us that he did not intend to proceed to town directly; but the mystery was soon cleared up. On arriving at his settlement he was told by an old Indian woman, whom he had left at the place, that, during his absence, a strong party of Accaways had been at Warapoota in search of him, and being disappointed in meeting him, they had proceeded to Demerary River, to take revenge on the Arrawaak chief Simon, who, some years ago, fell with his followers upon one of their parties encamped peacefully on the Essequibo, and slew seven of their number. Macoosie James reasoned, therefore, that they would probably return, and considered it advisable to hasten his departure.

He kept close behind us as long as we had to pass the different paths which communicate with Demerary River, and only after we were among the series of the first rapids he slackened his exertions, and remained behind us.

The Potaro, or Black River, gives to the Essequibo its dark colour again, which thus undergoes four changes. At King William's Cataract it has a dark brownish tint, which becomes lighter after having received the white waters of the Rupunoony; further north it is tinted by the red waters of the Siparoony; yet further north the Potaro restores it to its first tint, which it preserves till the junction of the Mazaroony and Cuyuny, where it has again the colour of the water north of the Rupunoony. The changes are remarkable.

We flattered ourselves that after we have passed the Arissaro Mountains, the weather might become a little more favourable, as it is well known that mountains in general, but chiefly wooded mountains, attract the clouds charged with rain; but we were greatly disappointed; the quantity of rain which fell daily was more than I ever had experienced in a similar time. We were obliged to encamp at noon, at the foot of the Arissaro: the rain

* It is truly to be wished that no one may be more successful, and that no civilized hand may ever again be raised to deface these monuments of the 'untutored Indian.'—Ed.

fell in torrents, and in order to keep us warm we made several fires under and in the neighbourhood of our hammocks. The thermometer stood in the afternoon at three o'clock 72°, and our breath became plainly visible when we conversed with each other. An awful crash awoke me out of my first sleep, the sound of many voices, and the cries of a child startled me. A tree had fallen in the midst of our encampment; providentially only the outer branches had struck the hut; the shock was, however, strong enough to throw it down. Had the tree turned a yard more aside, the inmates of the hut could scarcely have escaped destruction. We passed next morning the mouth of the streamlet Moucou-Moucou, one of the most frequented thoroughfares between the Essequibo and Demerary. By following the course of the Essequibo, the Indian on his way to town is obliged to pass the coast, and though not afraid of shooting the falls and rapids of the inland rivers, more dangerous than the surge of the sea along shore, the novelty of this navigation has something frightful for him; he prefers, therefore, leaving his canoe on the banks of the Essequibo, and crossing over on foot to the Demerary River. The Moucou-Moucou comes from an eastern direction, it is, therefore, soon abandoned, the path then leading through dense woods. After penetrating for ten or twelve miles it divides in three branches, the highest of which leads to Piawatanni, the second to the Post-Seba, and the third to a settlement further north; the journey is generally performed in one day and a half, and, the ground being perfectly level, this portage may hereafter be of great advantage. A few miles south of the Moucou-Moucou is the rivulet Cortuaharo, from whence a path leads likewise to Demerary River.

The distance between the rivers is scarcely more than eighteen or twenty miles, and a connecting canal might be easily constructed.

The weather was still wet when we started in the morning; in the afternoon our large coorial was the only one in sight; this did not alarm us; they might have chosen another channel, or their zeal to keep up with us might have relaxed; for the first time since the commencement of our expedition, we passed one night separated from the others. Our huts were situated on the foot of Etabally Fall, the descent of which was much easier than I expected. We fired several times in the course of the evening, and likewise in the morning before we started, and as our signals remained unanswered, we concluded that the boats might have preceded us. The fall of Taminett, or Arisaro, was before us; we did not find it difficult to ascend it; what was, therefore, our astonishment, when the river, as far as our eyes could range, presented one foaming mass; torrent contending with torrent, foam-

ing eddies and whirlpools! Our helmsman, in consequence of the success with which he had brought the coorial so far, became daring, and before we were aware what he was about, we were already in the midst of the rapid, and the waves, as if incensed at our temerity, dashed violently against the boat, and the next moment one of them, more forward than the others, rose to a considerable height, curled its head, and striking the bow, almost filled the boat, and nearly sunk it. Jacobus received many reproaches for his foolhardiness, not only from those whose lives he had risked, but likewise from the coloured people on the Essequibo, who thought we were jesting when we told them that we had descended Taminett. On the morning of the 18th of March we passed the last rapid, and approached now the habitations of civilized persons.

How grateful were my feelings towards the Almighty, who brought us safely through dangers of a manifold nature, and 'led us forth by the right way, that we might go to the city of habitation!'

We landed at Mr. Bradford's; his house, at a projecting point of the river, commands a fine view of those numerous inlets and rocks which fill the river, and give the first indication, while ascending, that the rapids are not far distant. I threw many an anxious glance in that direction, to discover the missing boats, but in vain. We proceeded to Hipya, where, on our ascent, we passed a night in the unfinished 'house of prayer.' The settlement consists of coloured people and Indians; the children of which are not only instructed in religion, but likewise receive the first rudiments of reading.

One of the missionaries from Barteka-Point performs divine service here two or three times a month. The house of prayer to which the neatly-executed hut was dedicated, formed of posts from the neighbouring wood, and covered with the leaves of the trooly and other palms, afforded us again shelter, and every hope of a night's comfortable rest. How we luxuriated in the idea of enjoying sleep, undisturbed by rain and wind! The wish to await the missing boats, and the weather made us stop as early as eleven o'clock; and we had thus an opportunity to dry our hammocks and clothes by large fires, which the kindness of the inhabitants had kindled for us. We were less fortunate in procuring provisions; indeed, it appeared that the settlement was also in want. The rain prevented the men from fishing or hunting; and though many of them had still the cassada-root in plenty in their fields, it was difficult to get the roots to their huts, as the way to the field was overflowed.

We had comforted ourselves while on the cassada diet with the idea, that, ere long, we should have the power of choosing of what

our meals should consist, and we pictured to our imagination a choice of delicacies. Vain hopes indeed! Not even the necessaries of life were to be procured, and some fresh cassada bread in lieu of our hard old stock, now several weeks old, was the only change on our breakfast table; but, in the afternoon, some kind person sent us part of a deer to the settlement, which, prepared for dinner, was very grateful.

In the course of the afternoon the missing boats arrived, with the exception of one which was quite new, and for the first time on the Essequibo. It had been put under the guidance of Hermanus, a Caribbee: and as it had passed our hunting boat in the morning early, its non-appearance created uneasiness. Hermanus was, however, known to be steady, and well acquainted with the channels and cataracts; we concluded therefore that he had preceded us to the post. The coorial contained eleven Indians, men, women and children, part of my collections of Indian curiosities, the whole of my geological collections, the barks of several remarkable trees, gums, and divers seeds.

How did we hail the appearance of the post which, during our absence in the interior, had been removed to Ampa! We had been the whole morning in a state of excitement: the people who inhabited the western bank of the river left their huts, and stood in groups on the shore waving their hats and handkerchiefs. Though we were perfect strangers to them, and they to us, our expedition had excited their interest; and the weak state in which our coloured crew left us at Annay, had made them fear that we had fallen victims to disease. The former coxswains of the two coorials, the 'Maconochie' and the 'Bentham,' showed so much delight at seeing us again, that we must have been hard-hearted indeed if it had not touched us. The post-holder, Mr. Richardson, and his family, received us with every demonstration of kindness and hospitality; and the only damp thrown over our joy was the uncertainty of the fate of Hermanus and his crew. That day and the next elapsed: boats had been sent in different directions, as we had been informed that a coorial with Indians had been seen passing. Their return without further information caused wailing indeed among the relations of those who were missed; every one gave them up for lost. A boat was at last espied on the third day; it approached the post; and the relief it afforded us, when we recognized the crew of the missing coorial, I need not describe. They were not in their own craft, but in that of Macoosie James; the coorial, with its cargo, was entirely lost at the fall of Etabally. Hermanus possessed a woodskin, which was loaded with hammocks and other articles of trade. As she required two men to navigate her, of which the other coorials stood rather in need, we had several times requested him to put his effects in one of our

coorials, and to abandon her, in which case I promised to pay him the full value of the woodskin; but his Indian obstinacy was not to be overcome; and thus was incurred a very serious loss in the result of the expedition. The morning after our separation, the woodskin being in company with the coorial, shot the rapid first; negligence or accident made her run against a rock, and she upset. Hermanus, who followed her close, in attempting to assist her, ran too near the rocks, his coorial became unmanageable, she was carried forward by the current, and running against a rock partly hidden, she split right in two. The lives of the poor inmates were in the greatest danger; his wife disappeared twice under the water, and only to the presence of mind of one of the Macoosie Indians, who dived after her, she had to attribute her preservation. Fortunately for the crew thus saved, Macoosie James, well aware that there was no danger of meeting the Accaways at the region of the lower falls, took it much easier, and made slower progress than we did; and on his arrival at Etaballv, he discovered the poor beings, and took them in his boat. Grateful that all were saved, I forgot at first the loss of my geological and other collections; it nevertheless has left a chasm which cannot be so easily filled up; and a regret that so much labour was thrown away often intruded itself upon my feelings.

This is too frequently the lot of the traveller. After having amassed treasures of natural science, and having taken every pains to preserve them, weather, accident, negligence, and malice, often conspire to deprive him of them. How frequently was I obliged to use every persuasion to induce the Indian to carry the geological specimens collected during our pedestrian tours! I might have loaded him with provisions, wearing apparel, &c., and he would not have objected to it; but to increase his burden, by adding rocks, he thought, could only be done out of mischief; therefore I had been more than once under the necessity to carry the specimens myself, assisted by my companion,* when we traversed the savannahs between the Parima Mountains and Pirarara; and almost the whole of them (eight specimens only being saved) were doomed to be lost, after having passed the upper and more dangerous falls. Nor was this my only loss; numerous were the plants spoiled by rain; several members of my menagerie also died in consequence of the wet, and the lessened attention paid to them: and it wanted an additional portion of energy to induce me to attempt to save what could be saved, after we arrived at the post.

My companion,† anxious to see his relations, left me at Ampa, and proceeded to George Town, while I unpacked boxes and chests, to expose to the air their contents. It was heart-rending to

Lieutenant Haining, 65th Regiment. † Mr. Brotherson.

see the state they were in. In spite of oil-cloth, palm leaves, and other covers, if not the rain, the moisture had found its way into the packages; and, for a second time during the first expedition, the mildew had committed the greatest ravages among the plants and birdskins.

I left the post on the 28th of March, in my coorial, manned by twelve of the best and ablest men; most of them were for the first time on their way to town—I was therefore anxious to see what effect the aspect of our ships, our buildings, &c., would have upon them. Zeno himself could not have showed more unconcern than these savages. I watched a boy of the Atoria tribe, who occupied the bow; he threw a glance on the object which was new to him, but there was no change of feature; and the next moment the eye was directed again upon the head of the coorial; even the ferry steam boat, which was plying between shore and shore, did not interest them. I was greatly disappointed. At my arrival in George Town, I received the greatest demonstrations of gladness at my safe return. I hastened to present myself to Sir James Carmichael Smyth, the governor, who received me in the most obliging manner, and the interest thus displayed made me forget the sufferings of the previous six months.

If I were asked—Is the country adjacent to the banks of the River Rupunoony favourable for colonization? I should unhesitatingly answer, No. Though the landscape may please the eye, the soil consists mostly of arid sands upon a clay substratum, and is unproductive. Woods form only here and there a fringe along the river and its tributaries, and either disappear entirely, when retiring from the river's banks, or become quite stunted in growth. The only fertile soil is along the foot of mountains, or on their ridges; but even here it is soon exhausted, and the Indians are obliged to change their provision grounds every three or four years. The savannahs are mostly destitute of water, and where it is found, it is but too frequently injurious to the constitution.*

The Indians quench their thirst with Piwarrie, for which purpose the water is boiled, and loses perhaps its pernicious influence. The grass which covers this arid plain is diversified in its nature, and not always fit for food for cattle. The savannahs of Annay produce thus grasses belonging to the genus Elymus, Festuca, Cy-

* While we were encamped at Annay, in November, 1835, we dug holes in the savannahs, which were scantily filled with a whitish water, unpleasant in taste, and when exposed for some time to the sun, we found it covered with a greenish scum. We had to send therefore a distance of nearly five miles to the brook Annay to get good water. Traversing the savannahs of Pirarara, the heat of the atmosphere caused almost an insupportable thirst, and we drank copiously of the brook Pirarara, and likewise of some pools; the consequence was, that dysentery to an alarming degree broke out. I myself was so weakened in twenty-four hours, that the Indians were obliged to carry me in a hammock from Pirarara to the Rupunoony.

perus, and others, and are entirely unfit for grazing grounds; though these savannahs are connected with those of Pirarara, on which numerous herds of wild cattle graze, none have ever been seen by the Indians about Annay.

The climate is by no means so healthy as it has been supposed. I do not infer this from the circumstance that our whole party was more or less indisposed while sojourning in those regions, but the Indians themselves suffered from fever. We found whole families afflicted by fever when we returned in January from the upper regions of the Rupunoony. The measles likewise committed great havock among these aborigines, who, when covered with the disease, and warned by us not to expose themselves to cold, considered nevertheless that the best remedy for allaying the insufferable heat was to plunge into the water. No family of those we visited but had to relate the loss of relatives.

'What, then,' will be the question deduced from the above remarks, 'can have induced the Indians, those simple children of nature, to select such regions for their abode?' And often have I thus asked them myself without receiving a satisfactory answer. The love for the native soil may be the reason, which, nevertheless, is subjected to superstition; let death have taken place among the more influential members of the settlement, and every individual will leave his hut; the fields may be ripe for crop, or may just have been planted—nothing can conquer the fear that their further abode at that spot is displeasing to Kanaima, the arch-enemy of the human race.

Nevertheless, the savannahs may prove profitable to the enterprising colonist. The herds of wild cattle and horses which graze on the savannahs of the Rio Branco and its tributaries, the Tokoto and Maou, may be transported to the colony of British Guayana, where ready purchasers will be found.

The Brazilian horse, though small, is swift, and from youth accustomed to the tropics, and hardships, which are great recommendations for the purchaser.

The best means of bringing them to the coast would be to lead them across the savannahs and mountains to the foot of Makarapan; there are so far no difficulties to be surmounted: from thence it would be necessary to swim them across the Rupunoony to its right shore, and for a second time across the Essequibo, from whence a path might be constructed to the vast savannahs which extend between the rivers Demerara and Berbice. The foot of the Makarapan Mountains might be reached from the Brazilian fort San Joaquim, in eight days, without imposing much upon men and horses. From the information I have gathered, I know that the plains between Berbice and Demerara are of great extent; but I am unable to point out the direction in which they

will be most easily reached. On establishing such a communication, the cattle, which are now sold at six dollars per head, may prove likewise profitable to the colony.

According to my opinion, the regions south of the islands at the mouth of the Essequibo, as far as the second series of cataracts, are the best calculated for colonization. The soil is various, and highly productive; the expenses connected with clearing the ground would be repaid by the value of the timber cut down. Barteka Point, at the confluence of the rivers, will then become the nucleus of the inland trade; and canals may connect it with the upper regions, while the latter, by an intercourse with the Demerara River, have the option to choose the market for their productions.

The opinions thus advanced would have been fully supported by the specimens of soil which I collected along the whole distance from Barteka Point on the Cuyuny, to the Cortatan of the Rupunoony, and King William's Cataract on the Essequibo; their loss at the falls of Etabally adds considerably to the regret I feel for my geological collections in general.

A few words must be said of the map. The position of the light-house at George Town, Demerara, is 6° 49′ 20″ N. lat., 58° 11′ 30″ long. W. of Greenwich, as ascertained by Captain Owen in 1833; and the course of the river Demerara is also laid down from his admirable survey of that river as high as the great fall, during the same year; the general coast line is from the Admiralty charts; the mouths of the Orinoco from the best Spanish authorities and documents in the Colonial Office; the Lower Essequibo, as far as the junction of the Cuyuny, is from the Dutch map of Major von Bouchenseiders, corrected by the best information that could be procured on the spot. From Barteka Point upwards, the rivers Essequibo and Rupunoony are laid down from a daily journal of courses, distances, and bearings regularly kept during the whole of our journey—checked by astronomical observations as recorded in the report, whenever the weather would permit; the longitude of Annay, obtained by several sets of lunar distances, forms a fixed point for the River Rupunoony and the Upper Essequibo. The River Mazaroony is dotted in, to point out its relative situation; it rests on the authority of Mr. Hilhouse; the Cuyuny has never been explored; and of the rivers Berbice and Courantine we know but very little.

Incomplete as such a map confessedly is, it is still the only one yet compiled, that has any pretension to accuracy, of the colony of British Guayana.

By a daily register of the temperature of the air in the shade, with a northern aspect, between 6 A.M. and 6 P.M. from October, 1835, to March 31, 1836, between the parallels of 2° 36′ and 6° 49′ North latitude:—

Fahrenheit's Scale.

	Oct.	Nov.	Dec.	Jan.	Feb.	March.	Total.
Highest	87.5	89	86.5	88.9	85.9	84	
Mean.	79.1	82	80.1	82	81	76.5	
Lowest	68	72	68.5	75	74	69	
Number of rainy days with little intermission	12	2	11	6	12	27	70
Days with little rain	9	10	11	16	12	4	62
Fair, without rain	10	18	9	9	5	0	51

The temperature of the river-water was also tried at every opportunity. The results were, that

At 6 A.M. Water generally from 8° to 10° warmer than the air.
At 2 P.M. Air generally from 1 to 2 warmer than the water.
At 6 P.M. Water generally from 2 to 3 warmer than the air.

* * * *

Among other collections in natural history, sixty-six specimens of birds were presented to the British Museum.

Several papers on botanical subjects have been sent to the Linnæan Society, illustrated by drawings and specimens in spirits. Among them is an account of Strychnos toxifera, the Woorali poison plant, for the first time sent to this country; it seems to belong to the same genus as the plant which produces the nux vomica, and the Tieuté poison of Java.

Dried specimens of about 170 species of plants; among which are some highly curious.

Seeds to the Horticultural Society.

A considerable number of orchideous plants in a living state; among which are a beautiful new fragrant Cattleya, with bright purple flowers; Maxillaria flagellifera; Oncidium Lanceanum; and a curious new genus, apparently allied to Maxillaria.

[By the latest accounts from Mr. Schomburgk, dated Demerara, August 22, 1836, he was on the point of starting to explore the River Courantine, the eastern boundary of British Guayana, with the intention of crossing over from its sources to the Upper Essequibo, and thus continuing his examination of the interior, and of the range called Sierra Acaray, the line of separation, in this part of South America, between the basins of the Essequibo and of the Amazons.]

XVI.—*Survey of some of the Canary Islands, and of part of the Western Coast of Africa, in* 1835. Communicated by Lieutenant W. Arlett, Royal Navy.

His Majesty's ship Ætna, commanded by Lieut. W. Arlett, and Raven cutter, Lieut. H. Kellett, left England the 12th of November, 1834, to survey the western coast of Africa from Cape Spartel to Cape Bojador; and also, if permission could be obtained, those islands of the Canary group situated nearest to the coast of Africa.

On the 29th we anchored in Santa Cruz Bay, Teneriffe, where, on application, we immediately obtained permission from the Governor-General, Don Juan Marron, to carry on our operations. Our meridian distances were all measured from the mole-head at Santa Cruz, which was assumed at 16° 16′ 0″ west of Greenwich, and upon this position all our longitudes depend.

On the 14th December we arrived at Port la Luz, in the island of La Gran Canaria, the *Great Canary*. This island is nearly circular, and about twenty-four miles in diameter, or seventy-five in circumference. It is mountainous, and the coast, generally speaking, precipitous.

Port la Luz, which affords good anchorage and shelter from the prevailing north-east winds, is formed by the Isleta, a rocky peninsula, whose point of connexion with Canary is a low sandy spit. Las Palmas, the capital of the island, is situated in the bay. It is a large, handsome town, at present containing 18,000 inhabitants. There is a cathedral, hospital, and college, with convents for monks and nuns of all orders. The city is well supplied with water, having fountains in all the principal streets and squares. The mole is at present in an unfinished state; the market is well supplied.

The latitude and longitude of the mole-head agree very closely with that assigned it by De Borda. A slight correction has been made in the latitude of the north point of the Isleta. A base having been measured, a triangulation was carried completely round the island, whence the soundings as well as the coast line were laid down trigonometrically. The island of Canary affords more anchorages than any of the other islands, the bank almost everywhere extending farther. During the summer, when there is a constant north-east wind, the high land obstructing its course, occasions calms to prevail off the south-west end of the island to the distance of eight or nine miles from the land, where the divided currents again unite. The same cause, however, occasions a westerly current close in shore, which the island vessels take advantage of. In many charts the position of a rock is given about seven miles to the westward of Point Aldea on the west

side of the island; it was diligently searched for: the result may, I think, be considered decisive against its existence. The highest peak of Canary, El Cumbre, or Summit, was ascertained by barometer to be 6648 feet above the sea. The mountain of 'Sancillo,' nearly in the centre of the island, is 6070 feet in height, and has a large wooden cross on its summit.

From Canary we proceeded to the Canal del Rio, the strait at the northern extremity of Lanzarote, which separates that island from Graciosa. It is in most parts rather more than a mile wide, and is the most capacious and only safe port for large ships in the Canaries; the extreme difficulty of communication with Lanzarote presents, however, an insuperable objection to its being resorted to as a harbour for trade. The basaltic cliffs here rise almost perpendicularly to the height of 1500 feet, and can only be climbed by a narrow path which winds along the face of the precipice; half way up the cliff is the only spring of fresh water in the island, but rendered useless from its situation, except to a few goatherds. At the north-eastern extremity of Lanzarote are two remarkable rocks, in shape resembling the Needles between the Isle of Wight and the coast of Hampshire, and composed of black vitrified matter. On the outer of these rocks, and likewise on the Roquete del Este, or East Rock, the craggy summit of a volcano, situated somewhat more than seven miles north-east of Lanzarote, guns were landed, and a base by sound measured; the mean of many measurements being taken under various states of the atmosphere, a series of triangles were carried over the Little Canaries, Lanzarote, and Fuerteventura.

Allegranza, the northernmost of the Canaries, is a small island composed of a mass of lava and cinders, the product of a volcano now extinct; it rises 939 feet above the sea; the edge of the crater is well defined, and two-thirds of a mile across; its bottom is cultivated for barilla. The western cliffs are precipitous, and 700 feet high.

Forty persons reside on the island, who are principally employed in collecting orchilla. The only landing-place is on the south side, where a cavern runs for about 500 paces slanting from the sea, and terminates in a little sandy bay, open above. At the entrance, the rocks form a natural jetty. The village is situated immediately above, and abreast is the only anchorage, half a mile from the shore.

The Little Canaries are connected with Lanzarote by a bank, on which there is, for the most part, forty fathoms water.

Lanzarote.—This island extends in a north-east and south-west direction about thirty-one miles, with a breadth varying from five to ten miles; it is mountainous, of volcanic origin, and has many extinct volcanoes. Its centre rises about 2000 feet above the

sea. From its northern extremity a barrier of precipitous cliffs, rising to the height of 1500 feet, run in the direction of south-west seven miles, terminating in an extensive sandy plain, where, in 1825, a volcanic eruption took place, and two considerable hills were thrown up, which are still burning; a stream of lava, from 200 to 300 yards in width, found its way to the sea in the bay. From Point Penedo to Point Pechiguera, the south-western extremity of the island, the shore is precipitous in the extreme, with the exception of one little bay called *Janubio*, where was once a harbour for small vessels, now converted into a salt-water lake by an eruption which took place in 1765.

The shores of the eastern side of Lanzarote are by no means so steep as the western: in the centre of the eastern side is the port of Naōs, a small but secure harbour, formed by several rocky islets: it has two entrances; the northern has a depth of twelve, the eastern entrance of seventeen feet and a half at low water, with a nine feet rise of tide. During the winter nearly all the island vessels resort to that harbour. Two bomb-proof forts, the one mounting eleven, the other twelve heavy guns, defend the respective entrances. The town of Arecife is situated immediately to the southward of the port. Many of the houses are large, and the streets spacious; its present population is 2500; the entire population of the island is 17,500. The greater part of the inhabitants of Arecife are engaged in the fishery on the opposite coast of Africa; it gives employment to between 400 and 500 men from this island alone, about 250 from Fuerteventura, and proportionably from the other islands. I have no doubt Spain could, in case of emergency, procure 2000 able young seamen from these islands without very much distressing the fishery. The highest land in Lanzarote is Montaña Blanca, 2000 feet above the sea, situated nearly in the centre of the island, and cultivated to the summit. The wine of Lanzarote is very superior to that of the other islands; the grapes are superior in flavour; the soil selected for their cultivation is decomposed scoriæ. The strait between Fuerteventura and this island is named the *Bocayna;* it is from four to six miles wide, and the depth from fifteen to twenty fathoms, and offers a good anchorage during the north-east winds: a regular tide sets east and west through the strait, but no current was felt during the fortnight we were here.

Fuerteventura, the next point of our survey, is an island fifty-two miles in length from north-north-east to south-south-west, by an average width of twelve miles; its general aspect is less mountainous than the other islands, yet both at its northern and southern extremities the mountains rise to 2500 feet above the sea.

Cabras, on the east side of the island, is the chief port; it is an insignificant place, containing 1000 inhabitants; the anchorage

is indifferent, and the landing-place, which is a beach of shingles, still worse: the whole of the exports of the island are shipped from hence. They consist of barilla, orchilla, corn, camels, honey, and goat skins.

Although the general feature of Fuerteventura is extreme barrenness, still there are many spots of great fertility; the most conspicuous of these is the valley of *Oliva*, towards the north end of the island, where there is a village of the same name, the residence of the Lieutenant-Governor, who is a lineal descendant of John de Bethancourt, and possesses a very considerable portion of the island. The valley of Oliva is about fifteen miles long, and generally from two to three wide; the only two streams of pure water in the island have their rise in the mountain of Atalaya (or Watch Tower); they are husbanded with great care, and irrigate the whole of the valley. A paved road, about ten miles from Cabras, towards Betancuria, or La Villa, is the only one on the island; the others are mere tracks following the direction of the valley, where the ground is less encumbered with stones, and softer to the camel's feet. Although double the size of Lanzarote, Fuerteventura has not a greater population, it being from 17,000 to 18,000, scattered in small villages over every part of the island.

The interior formation of Fuerteventura is singular: to the north is a group of extinct volcanoes—some of them, as Monte Mudo, rise to the height of 2160 feet—and which, to the southward of Port Cabras, branch off east and west to the sea, follow the direction of the coast on each side, for about thirty miles, and then again unite, encircling an extensive and arid plain; several villages are scattered about, and, from the summit of the hills, the course of some brackish streams may be traced by the verdure they impart. There are also some date palms, the only trees, except the fig, on the island.

From the southern point of junction of the mountains, one of which, Monte Chilegua, on the western coast, reaches the height of 2160 feet, a narrow sandy isthmus, about five miles in length and two and a half in breadth, projects, connecting it with the south extremity of the island, which is a peninsula, occupied by the mountain of *Jandia*. This mountain offers, perhaps, as remarkable features as any in the world; it presents its precipitous face to the north-west, rising 2820 feet. Spurs, or buttresses, diverge from its centre to the north-east, to the east, and to the south-east, by any of which it may be ascended. I had occasion to take my theodolite to the top of it, and, not aware of its peculiarity, on reaching its summit, was running forward, when I perceived that the narrow ridge on which I stood overhung a frightful precipice 2820 feet in depth. Point Jandia, the south-western extreme, is situated in latitude

28° 3′ N., longitude 14° 32′ W. of Greenwich. It is a low rocky point. A rock lies off it, south-west, distant half a mile.

In no part of the world is the barometer more susceptible of atmospheric changes than amongst the Canary Islands. A rapid rise is the sure precursor of an easterly wind, whilst the contrary as certainly indicates a change to west, or south-west. The easterly wind is accompanied by foggy or hazy weather, but clears immediately on changing in the least to the northward. When it blows strong from this quarter it is called by the fishermen a *brisa parda*. The temperature of the air is very equal: the average in December was 67°; in January, 67°; in February, 65°; May, 69°; August, 76° of Fahrenheit; and it seldom varied more than four or five degrees during the twenty-four hours.

At the end of February we left for Santa Cruz, where we arrived on the 4th March, and remained there a week, refitting the ship, rating the chronometers, &c.; on the 12th sailed for Cape Bojador, off which we arrived on the 14th. The Cape is situated in latitude 26° 7′ 10″ N., longitude 14° 29′ 5″ W. On approaching it from the westward, it presents no feature to distinguish it from the adjoining land, with the exception of a cliff gradually sloping from the southward, at the termination of which are a few straggling rocks, on which the sea breaks heavily. The land at the back, which is 150 feet high, is thickly covered with bushes: large herds of camels were seen grazing, and a number of Moors attending them; their camel-hair tents were pitched on the beach. Ten miles to the southward of Cape Bojador, (as I was informed by the Spanish pilot whom I had taken on board at Lanzarote,) and near the beach, wells of fresh water are found. This wandering tribe had probably followed us along shore from that spot, anticipating that we should attempt to land. It was my intention to have carried on the survey from Cape Bojador to the northward; but after many attempts I found the current so strong (running south-west one mile and a half an hour) as to preclude the possibility. Under these circumstances I stood across to the Canaries, beating to windward till I was enabled to stretch for Mogador, where we arrived on the 25th March.

On approaching the land in the parallel of Mogador, the first remarkable feature which strikes you is the craggy summit of Mount Atlas, covered with snow, and contrasting with the dark ridge of hills between it and the coast.

To the northward, the Jebel Hadid, or Iron Mountains, appear insulated, and as you draw nearer, a long patch of sand becomes visible; and finally, the white towers of Mogador rise, as it were, from the water. Soundings in 100 fathoms may be obtained at the distance of twenty-three miles from the shore, when

the water immediately becomes discoloured: the soundings decrease very gradually on a sandy bottom.

Mogador, or *Suirah*, stands on a low sandy spot, which terminates towards the sea in rocks: during high-water springs, the sea flows quite round the town, leaving at all times a swamp at the back of it.

The town is of a very irregular form, encompassed by a wall, with flanking batteries at each angle; these are, however, weak, more particularly the northern angle near the sea, where there is only one light gun mounted. There is a line of heavy guns on that part of the wall fronting the sea, and a battery at the sea gate. A battery mounting heavy guns is situated on a ledge of rocks, at the left of the entrance to the harbour; and on another islet is a battery having a circular bastion at one extremity (also flanking the entrance), and a square castellated battery at the other; from this, a fortified bridge (under which is the sea gate) connects the islet with the main, and terminates in another castle. From this castle a wall extends in a straight line to the town, a distance of about 200 yards. These fortifications were constructed by Genoese engineers, and though full of guns of large calibre, are not strong, the walls being slight, and the embrasures very close together.

Mogador contains about 9500 inhabitants, rather more than 4000 of whom are Jews; these last inhabit a quarter of the town separated by a wall from that of the Moors, whose portion is called the Citadel. The whole of the laborious work in the town and port is performed by Jews; and the domestic servants are all Jews or Jewesses. Much of the trade of the place is also in their hands; and, owing to certain exemptions from duty, they are enabled to undersell the European traders.

The principal exports are wool, gum, wax, hides, skins, almonds, honey, ostrich feathers, and gold dust. Imports, iron, hardwares, and cotton goods. The duties are fixed, and not very heavy. Formerly there was a great want of water, as the river is a mile and a half distant; but the present emperor has built an aqueduct, which conveys the stream to several large tanks built in different parts of the town. One of these is exceedingly convenient for vessels watering, being situated close to a jetty, inside the fortified bridge, where boats may fill, towards high water, perfectly sheltered from all winds. The market is excellent; provisions of all sorts, including fish, poultry, and game, are abundant and cheap, as are also fruit and vegetables. The price of beef is regulated every day by an officer appointed to superintend the market.

The latitude of the British Consul's house is 31° 30′ 29″ N., longitude 9° 47′ 38″ W.; variation 19° 30′ W. From its flat

roof the highest snowy peak of Atlas, bearing S. 45° E., was distinctly visible.*

The roadstead, during the winter, can scarcely be considered tenable; and even in the summer the strong north-east winds which prevail cause a very disagreeable sea. A westerly wind throws a very heavy swell into the harbour; but, notwithstanding the reports which prevail to the contrary, it is not unsafe: and the master of a vessel, who had been for fourteen years constantly frequenting it, assured me that he had never known a vessel to be driven on shore that was properly found in anchors and cables.

The channel to the landing-place is intricate, but a stranger will experience no difficulty who refers to the plan of the port.

The harbour is formed by the island of Mogador, which lies about one-third of a mile to the southward of the point on which the town stands. The island is three quarters of a mile long, by one quarter broad. A battery at each end commands the entrances, and one on the inner side of the island protects the harbour. The small stream of Wad El Gh'ored falls into the sea about a mile and a half south of the town.

Although we had reached the 1st of April, the north-easterly wind, which I had reason to expect, had not yet commenced; and the tremendous swell which rolled in on the coast from the westward warned me of the danger of yet attempting the survey farther to the northward. A long base, by sound, was therefore measured between the vessels, and assisted by floating beacons; an uninterrupted chain of triangles was carried along the coast to the southward, as far as lat. 27° 40′ N., thereby not only enabling me to lay down the soundings correctly from the shore to the edge of the bank, assuming that edge to be at 100 fathoms, but likewise the detail of the coast and position of the Capes, with as much accuracy as if I had been able to land; which, independent of the hostility of the natives, the perpetual heavy surf precluded the possibility of. In addition to the advantages from this method of survey, was that of being able (from the circumstance of the ship being always during the night, and very frequently during the day, at anchor) to ascertain with accuracy the rate and direction of the current.

* It is a coincidence worth remarking,—were it only to encourage travellers to take correct bearings of every remarkable object in sight, however apparently useless,—that the highest western snowy peak of the Atlas, seen from the city of Marocco, by Mr. Washington, in 1830, is marked in his note-book as the "Cleft, or Cloven Peak," and bore S. 48° W.; and which, for want of a cross bearing, has never been made use of. The bearing of the snowy peak seen by Lieut. Arlett from Mogador, as stated above, was S. 45° E.; the intersection of these two bearings falls upon the Mountain Bibawan, as marked in our latest, and by far the best, map of Marocco, that published by the Society for the Diffusion of Useful Knowledge;—and thus is gained the position of a fixed point, of no very great importance, perhaps, but valuable in the dearth of information relating to the great range of Atlas.—Ed.

Cape Sim, or *Ras Tagrivelt,* lies 8¼ miles S.W. of Mogador; it is a low, sandy point, sloping gradually from the height of 490 feet, and terminating in a reef of rocks which extend on all sides to the distance of rather more than two-thirds of a mile. The intermediate coast between this and Mogador is a continued line of bare sand-hills, seventy feet high, sloping to the beach. The Botof sand-hills, in the backgiound, from being covered with a dark evergreen, have a very sombre appearance.

Cape Tafelneh, 18½ miles S.S.W. of Cape Sim, rises to 780 feet in height, terminating in a point from which a ledge of rocks extends half a mile, with deep water close outside them.

Kuleikat is a small village, situated on the side of a wooded hill, eight miles north of Cape Tafelneh. The small stream *Tidsi* flows through a picturesque ravine, and falls into the sea at its foot; hence to Cape Tafelneh, high cliffs, apparently of sandstone, face the sea.

Cape Ghir, or *Ras Aferni,* projects boldly into the sea 25 miles S. 5° W. from Cape Tafelneh; the intermediate backland rises to the height of 2895 feet above the water; the country appeared tolerably well wooded, and numerous villages and tombs were seen.

Cape Ghir is in latitude 30° 37′ 30″ N., longitude 9° 52′ 30″ W. It has been stated that this cape rises from an unfathomable depth, which is not correct, as the depth of water decreases very gradually to seaward, and soundings may be obtained at the distance of twenty-six miles. In approaching it from the westward it presents a bold, bluff sloping on each side, the highest part 1235 feet above the sea.

A rocky shoal, called the *Cleveland Shoal,* appears in our old charts, and Purdy, in his Atlantic Memoir, gives its bearing and distance from Cape Ghir; four days were employed in searching for it by both vessels without success, and I can state with confidence, that it does not exist in the position hitherto assigned it. It would be, perhaps, saying too much to assert that it does not exist at all; but the gradual decrease in the depth to seaward, with the nature of the bottom, which is mud and sand, very much favour that supposition.

Agadir, or *Santa Cruz,* situated on the summit of a hill 618 feet above the sea, bears S. 42° E. of Cape Ghir, distant 18 miles, and is in lat. 30° 26′ 35″ N., long. 9° 35′ 56″ W. The intervening land falling back forms a deep bay, in which there is good and secure anchorage during the prevalence of the north-easterly winds. High barren hills slope to the beach, which is rocky till at the distance of five miles north of Agadir, where a stream called Wad Tamaract, flowing through a verdant and apparently fertile valley, discharges itself into the sea.

The high land extending from Cape Ghir to Agadir, usually

called the Heights of Idautenan, is the western extremity of the main chain of the Atlas, which ranges hence in an E.N.E. direction, rising, at nine miles to the eastward of Agadir, to the height of 4408 feet, and a remarkable conical hill 3980 feet.

About half way down, between the town of Santa Cruz and the sea, there is a battery, in a ruinous state, originally intended to command the anchorage and protect a spring of water near the beach.

The walls of Agadir have fallen in many places, and the Portuguese town of Fonté, situated on the beach, in the bight of the bay, is a heap of ruins, and would be scarcely distinguishable but for the tombs of two Moorish saints, which are kept white-washed.

The Bay of Agadir affords good shelter, with a moderate depth of water, from the strong north-easterly winds, but is exposed to those from the westward. It is quite alive with fish, great quantities of which are caught, dried, and sent to Mogador and to the interior; and this is the only trade which it possesses. The current which prevails along the coast of Marocco is not felt abreast of Agadir till at the distance of six or seven miles from the land, being deflected by the projection of Cape Ghir. This is certainly one of the best, if not the best roadstead for shipping along the coast of Marocco; provisions good and plenty, and water easily procured. Mr. Jackson states, that during his residence here for three years no vessel was lost or damaged in the bay.

Immediately to the southward of Agadir, a very low and flat country commences, and extends for twenty-nine miles. The river *Sús* discharges itself into the sea at five miles distance from Agadir. Jackson remarks that this fine river rises at *Rás al Wad** at the foot of Atlas, thirty miles from the city of *Tarudant*, and conjectures that it was formerly navigable as far as that place, in consequence of there being still in the walls of the castle of that city immense iron rings, such as we see in maritime towns in Europe, for the purpose of mooring ships. At present there is a bar of sand across the entrance, dry at low water; and it could not be entered at any time by vessels drawing more than four or five feet water. From the river Sús, the same description of sandy coast continues to the southward. The *Wad Messa*,† distant thirty-seven miles from the former, has a dry bar across its entrance at low water; but probably a depth of from four to five feet at high-water springs. Like the Sús, the waters of this river are drained off for the purposes of irrigation. This river was formerly navigated by the Portuguese. A short distance inside, on the

* The sources and the course of this river rest on very doubtful authority.—Ed.

† Some confusion in the names of these rivers has crept into our maps, which at present we cannot set right.—Ed.

northern bank, there is a village; and to the southward, situated near the beach, an old castellated building.

A few miles to the northward of the river Messa are some wells of fresh water; the anchorage off which Jackson calls Tomie, or the Seven Wells. This roadstead differs in no respect from the anchorage which can be found on almost every part of the coast. At the distance of sixteen miles from the shore there is a depth of eighty-six fathoms, dark sand; at five miles, forty-five fathoms sand and mud, decreasing very gradually to the beach.

Cape Agulúh of De Borda's chart,* but which, in fact, is only a slight rounding of the coast, is in lat. 29° 49′ N., long. 9° 48′ W. The intervening coast curves considerably, and forms an extensive and rather deep bay, in which are the rivers I have already described. From the Messa, the appearance of the country alters considerably: the beach still continues sandy, but hills, which are green and verdant as they approach the sea, break off into cliffs, apparently of sandstone, about 100 feet in height. At the distance of fifty or sixty miles inland, a range of mountains, whose average height is 2200 feet, begin to diverge towards the coast. The intervening country, as far as one could judge by the eye, was gently undulating, wooded, and well cultivated. The houses, though numerous, are scattered; they are built of dark red brick, or clay; many are large, and surrounded by farm buildings. Immediately to the southward, a valley runs up from a little sandy bay, which, at the distance of a mile, is crossed by a hill on which the town of Agulúh is situated. A small stream runs down the valley: the slopes of the hills were waving with corn nearly ripe (in May), and the country had altogether a most pleasing appearance. Twelve miles to the southward of Agulúh, the features of the country alter, the hills become barren and abrupt, and form in successive ridges, which gradually increase in height, till they join the line of distant mountains, which here reach the height of nearly 4000 feet, and appear to be the south-western extremity of one of the offsets of the Atlas Range. As we proceed to the southward the country still continues the same inland; but the features of the coast alter, the barren hills and sandy beach give place to dark-red cliffs, broken into little bays and coves: in some of these, boats were hauled up on the beach, the first we had seen since leaving Agadir: there were also many villages. The pilot I had taken on board at Lanzarote informed me that a Spanish fishing vessel was captured on this part of the coast in 1833, and that the crew had never been heard of. Whilst at anchor, a boat pulled towards us, showing a white flag: we immediately sent one

* M. de Borda's chart of this coast was the most correct extant, prior to this survey.—Ed.

from the ship with the same signal, but the Moors fled for the shore as we approached them.

In latitude 29° 22′ N. is a remarkable white cliff, which appears to be of limestone. Its strata are extremely curved and irregular, and it forms a good mark for the coast; behind it, and standing alone, is a conical-shaped mountain, rising to the height of 3906 feet. In this latitude, twenty-five miles from the shore, you obtain soundings in 105 fathoms, of broken shells: outside of this, the bank drops very suddenly: standing in shore, the soundings decrease rapidly to sixty fathoms. At five miles from the shore you have twenty-eight fathoms, coarse sand; and from thence the depth decreases very gradually to the beach. From the cliff which I have described the country assumes a more rugged and barren appearance; the hills steep, with deep and narrow ravines; between the coast, alternate cliffs and sandy bays; but all the promontories rocky and rugged.

In latitude 29° 10′ N. is a little bay, which appears in all old charts under the name of Port Reguela, or Gueder. Two rocky promontories project a short distance, whose sides are steep and barren: a deep and narrow ravine separates them, down which a slender stream finds its way to the sea. In this little bay the water is deep, and bottom clean to the beach; but it affords no shelter: a landing may generally be effected in it.

In latitude 29° 3′ N. the mountainous country terminates, and a sandy desert commences. There is also a break in the coast, which has the appearance of, and probably is, the dry bed of a river: it is called by the Canary fishermen Rio de Playa Blanca.* When four miles to the southward of this, the coast-line breaks into bold sandstone cliffs, with sandy downs in the interior, entirely devoid of herbage, and continues so the whole of the distance to Cape Noon.

Chenier, in 1787,† and after him Jackson, speaking of the country between Agadir and Cape Noon, says, this is a tract of coast which holds out great encouragement to commercial enterprise, and secure establishments might be effected upon it, which would amply remunerate the enterprising speculator. The people of Sus are well disposed towards Europeans; and the communication with, and short distance from, the provinces, or districts, where most of the valuable products of Barbary are raised, render it peculiarly well adapted for trade. But, he observes, all along this dangerous and deceitful coast, there are rocks even with, or very near the surface of the water, over which the waves break violently; and the rapidity of the currents, which invariably set in towards the land, too often drives vessels ashore here. The dangers of the coast this journal will have disproved;—the former paragraph re-

* The river of the White Beach—possibly the Wad-E-Stá of our maps.

† Recherches Historiques sur les Maures.

lating to commerce is confirmed by Mr. Wilshire, the British Vice Consul at Mogador, a gentleman well known for his philanthropic exertions in liberating Christians from slavery. He has extensive connections in Sus and Wed-noon; his agents reside there, and are in frequent communication with Timbuctoo: and he assured me that he would have no difficulty in guaranteeing any person a safe conduct to and from that city. Mr. Riley, whom I met at Mogador, and who had travelled through Wed-noon and Sus, describes them, particularly the latter province, as peculiarly fertile and populous. He says the people are less bigoted and more friendly disposed towards Christians than the Moors generally are. Hence it would appear that the only obstacle which opposes itself to opening a trade with these countries, is the want of harbours.

Cape Noon is situated in latitude 28° 45′ 45″ N., longitude 11° 4′ 10″ W., variation 19½ westerly. It presents a cliff of sandstone 170 feet above the sea; and owing to the cliffs, some distance on each side, being of the same height, and the country inland a flat sandy desert, it is difficult to make out the exact projection till very near it.

The water is deep close to the Cape, and there are no dangers near it. The depth gradually increases from the beach; and at the distance of four miles there are from thirty to thirty-four fathoms, reddish sand; at twelve miles, fifty-seven fathoms, dark sand; and at the distance of thirty miles, ninety-eight fathoms, coarse red sand; the water then deepens very suddenly. I have been thus particular in describing the extent and nature of the bank for the purpose of correcting the hitherto received opinion of the flat nature of this coast. For a long distance both to the northward and southward of the Cape, as well as to seaward, the water is very much discoloured. It has a red tinge, and is so thick that the track of a ship is visible for a length of time. This peculiarity in the colour of the water may have alarmed navigators, and made them apprehensive of shoals, and in some measure accounts for the reports respecting the flatness of the coast. This discolouration of the water is most probably occasioned either by the quantities of sand which are blown off the desert, and with which everything on board soon became perfectly caked; by the turbid waters of two large rivers, the Wad Shleema and Wad-Noon, which here discharge themselves into the sea; or by the current, which, meeting an obstruction from the Cape, may, on being deflected, agitate the loose sand at the bottom, and cause it to mingle with the water; and possibly by all these causes combined.

Four miles to the south-westward of Cape Noon is a river which appears under several names. By De Borda it is called the Wed-Noon; by Jackson, the Akassa; and by Mr. Wilshire I am informed that its name is the Shleema; and by this I have de-

signated it. Thirty-one miles to the southward of the Shleema, and in latitude 28° 19′ N., there is another river of about the same magnitude: on which of these the town of Wad-Noon is situated I know not.* Singularly enough, the descriptive features of the land might easily answer for either river, and the latitude of this river is that in which the Akassa, or Shleema, is usually placed. Mr. Wilshire is only aware of the river on which the town of Wad-Noon is situated, and which I imagine to be that which is nearest the Cape.

Jackson, quoting Leo Africanus, says that it is not impossible that the river Draha, instead of losing itself in the desert, may fall into the sea. In my chart of the coast I have called this southern river the Noon: like the Akassa or Shleema it has a bar across the entrance, but on which I am satisfied there is at least water enough for large boats; in fact I met with people at Lanzarote who had traded in it. The heavy swell which prevailed whilst we were off here caused such a surf on the bars that they were impassable; and the limited time for the survey prevented me from waiting for a more favourable opportunity. Both these rivers appear to have deep water inside their bars, and the banks of both were verdant, and fringed with shrubs. The Shleema, when well open, may be recognised by two remarkable hills, which will then appear in the centre of the gap: they are conical, and on one of them are some ruins, said to be those of a Spanish or Portuguese fortress; this hill is 325 feet high. The coast between Cape Noon and the Shleema affords secure anchorage with a moderate depth of water from the month of March to October, and appears to me (should such a step be desirable) the place, of all others on the coast, the best adapted for the establishment of a factory, or for the opening of a trade direct with Wad-Noon. It is well known that that town has a great inland trade: from it a constant communication is kept up with Timbuctoo; and here the wandering tribes between Capes Noon and Bojador principally obtain their supplies; the produce of Soudan also passes through it on its way to Marocco; and could a direct trade once be established with it, it is not unreasonable to suppose that much of the gum trade which now goes to the Senegal would be diverted to it.

The coast feature between the Shleema and Noon presents a continued line of sand-stone cliff. A table-land, which is generally 900 feet high, just shows above the cliffs, at the distance of three miles from the shore, and where there is a regular depth of twenty fathoms, and good anchorage. When approaching the Noon, the

* From late accounts from Mr. Davidson, dated Wad-Noon, there is reason to believe that the former of these two rivers may be the river on which the town of Wad-Noon is situated; yet it seems very doubtful. See Mr. Davidson's letter in the miscellaneous part of the Journal.

table-land breaks into detached hills, one of which, 950 feet high, more isolated than the others, will serve to identify the river. The fishery carried on by natives of the Canaries may be said to commence at Cape Noon: the fishermen seldom venturing to the northward, although fish are equally abundant, from their dread of the Moors, who, on that part of the coast, possess boats. From the Cape to the Bank of Arguin, which is the extent of the fishery, the inhabitants of the Desert have not a single boat. The fishermen frequently land, not only to procure water, but to barter their fish for wool and orchilla: on these occasions great precautions are taken, as atrocities have frequently been perpetrated by both parties.

From the river Noon, the coast and inland features of the country continue the same as that described already between the Shleema and that river, the cliffs being about 120 feet in height as far as latitude 28° 7′, where nearly all the old charts place a harbour, which they call Porto Cansado; on this spot there is only a very slight curvature in the coast: here the cliff terminates, and a low sandy beach commences and continues in a west-south-west direction for the distance of eighteen miles, to latitude 28° 2′ N., longitude 12° 14′ W.; where there is the entrance of what I have no doubt to be the real Porto Cansado of the Portuguese, and which in Purdy's 'Atlantic Memoir' is very accurately described from the description of a seaman who was wrecked in the vicinity. The entrance is narrow, widening inside, and forming a sort of lagoon. The sea broke heavily across, and it is barely possible that boats may at times be able to enter. A table-hill, 580 feet in height, between it and the back land, is the only distinguishing mark.

Nothing can be conceived more dismal than the appearance of the shore hereabouts: for many miles not a dark spot is to be seen to break the monotonous appearance of the sand; the fine particles of which mingling with the haze occasioned by the heavy surf render the coast very indistinct.

From Cape Noon to Cape Juby the coast embays very considerably, Porto Cansado being the point where the indentation is the deepest; the coast then tends suddenly to the westward: in consequence of which the current, which has hitherto followed the direction of the coast, here strikes obliquely on the shore, previous to attaining its regular course. This, therefore, I consider the most dangerous part between Capes Spartel and Bojador, and this will account for the numerous wrecks we formerly heard of. The swell is almost invariably from the north-west, consequently directly on this part of the coast. I think it would be nearly impossible for a merchant-ship embayed here to work off shore.

A short distance to the westward of Porto Cansado a cliff, from ninety to a hundred feet in height, again commences, and continues for seventeen miles; it is of dark sandstone; the bottom being also of dark sand, gives a green appearance to the water. Inland a flat desert extends as far as the eye can reach. There is no beach, the sea breaking against the cliffs, on which it appears to be encroaching. Where the cliffs terminate, the country becomes broken into sand-hills partly covered with bushes, and the coast runs in the direction of S. 80° W. fifteen or sixteen miles to Cape Juby.

Cape Juby is situated in latitude 27° 57′ 50″ North, longitude 12° 55′ West; the variation, in 1835, was 17° westerly.

This is a low, sandy point, near the termination of which is a hummock covered with bushes, which, from all directions, has the appearance of an islet. Rocks lie off the Cape to the distance of one-third of a mile. The coast turning away suddenly, S.W. (true) forms into little bays, off the points of which are scattered rocks. From the river Noon to Cape Juby our progress along the coast had been zealously watched by a tribe of Arabs, and scarcely had the ship anchored half an hour, when their camels were perceived: they had probably imagined, from seeing a number of boats constantly near the shore, that a descent was intended. From Cape Noon to Cape Juby the bank of soundings extends to nearly the same distance from the land, and the depth decreases very gradually as you approach the shore.

The current from Mogador to Cape Bojador, except in the particular instances which I have cited, invariably runs in the direction of the coast, and its course in any particular latitude may be immediately ascertained by observing the turn of the coast as laid down in the chart. Its greatest strength is usually at the distance of from three to six miles from the land; gradually decreasing as you recede from it. Its average rate from Mogador to Cape Juby is from one-half to three-fourths of a mile per hour. At the latter Cape, probably from its stream being in some measure confined by the projecting Cape, and perhaps by the Canary Islands, distant only fifty-eight miles, it increases its rate to one mile and a fourth per hour; and off Cape Bojador its rate is about one mile. I did not perceive that this current was in any way influenced by any particular wind, but near the shore a tide was generally perceived. Thus terminates the survey to the southward.

On the 16th of May, with the Raven in company, we sailed for Gibraltar, touching at Teneriffe, for the purpose of measuring the meridian distance between Cape Juby and that island. On the 7th of June we arrived at Gibraltar, where twelve days were employed in refitting the ship, and in rating the chronometers for

the survey of the southern part of the coast of Marocco from Cape Spartel to Mogador. From the 20th to the 27th we were employed examining the danger called the Pearl Rock, near Cabrita Point, for avoiding which additional marks have been given, and the dangerous shoal of the Cabezos: but little could be added to the excellent plan of it by Captain W. H. Smyth, R.N., if I except there being rather less water on the shoalest part. On the 28th advantage was taken of a favourable wind to ascertain the chronometric difference of longitude between the Mole-head, Gibraltar, and the British Consulate at Tangier; observations were also taken for the latitude, which, in conjunction with very numerous ones made by the son of the Consul-general, Mr. Drummond Hay, place it in latitude 35° 47′ 10″ N.; longitude west of the Mole-head, Gibraltar, 0° 27′ 19″; and assuming Gibraltar as 5° 20′ 40″ W.,* we have 5° 48′ as the longitude of Tangier, somewhat different from its present assigned position. A survey of the bay had been lately made by the officer commanding the French brig of war Le Voltigeur previous to my visit, therefore it was unnecessary for me to repeat it. We made an excursion to Cape Spartel in company with Mr. Drummond Hay, for the purpose of making some observations connected with, and preparatory to, the survey. *Cape Spartel*, at the north-west extremity of Africa, rises 1043 feet above the sea, the summit composed of large blocks of sandstone; from this height it slopes gradually to the water. Three miles to the southward is a singular cavern of large dimensions, where from time immemorial it has been the custom to cut mill-stones, to which innumerable circles in the sides and summit bear testimony.

Tangier has already been described in Vol. I. of this Journal; I shall, therefore, only add that the old castle of Saracenic architecture is worthy of notice; the walls and ceilings of many of the rooms are beautifully tessellated. The present population of Tangier is supposed to be about 4000,† a very great decrease since Jackson wrote his account of Marocco, in 1809, if his statement may be relied upon.

Cape Spartel by my observations is in 35° 47′ North latitude, 0° 6′ 42″ longitude west of Tangier, slightly differing from its hitherto received position.—*July* 1. We here recommenced our survey. At half a cable's length from the Cape are a few craggy rocks, with ten fathoms water close to the rocks, and no danger which is not seen. At the distance of two miles from the shore

* The position of the Observatory, or Mole-head, at Gibraltar, was ascertained—
By Captain W. H. Smyth, R.N. in 1823, to be 5° 20′ 49″ W. of Greenwich.
By Captain Sheriff, R.N. . „ 1833, „ 5 20 40 „
By the latest Spanish Charts „ 1833, „ 5 20 40 „

† Washington, 7500 in 1830; Gräberg de Hemsö, 9500 in 1834.

there are ninety-eight fathoms, the bank immediately dropping to an unfathomable depth. To the southward of the Cape the bank extends much farther off, and there is excellent anchorage on a bottom of mud and sand, and shelter from easterly winds.

To *Arzilla*, which is distant twenty-one miles from Cape Spartel, the coast runs nearly straight in the direction of S.W. half W.; and with the exception of a few rocky projections, presents a clean sandy beach with a line of low hills, which, from the distance of half a mile inland, slope gently to the beach. Twelve miles farther inland there is a range of mountains called *Jebel Habib*, very conspicuous from the sea, the loftiest of which is 3170 feet above the sea. *Jebel Hasan*, another peak in this range, rather more to the northward, is 2270 feet high. Just to the north of the town of Arzilla is a castle built by the Portuguese. It is in ruins; and date trees, which overtop the walls, are growing in the court. On the wall fronting the sea, and which is strengthened by three towers apparently of more recent date, there are twenty guns mounted. Under the southern angle of the wall the well-whitewashed tomb of a Mohammedan saint contrasts singularly with the mouldering ruins adjoining. The country in the neighbourhood of the town is well wooded, and a quantity of land laid out in gardens. The present population of Arzilla is said not to exceed 600.

On this part of the coast there is a mackerel-fishery. At the time I was here, there were between twenty and thirty Spanish and Portuguese feluccas employed on it: their method of taking the fish is singular. Three hooks are fastened together; the fisherman throws a handful of salt or sand into the water, to which the fish rise, and are immediately jigged with great dexterity. The fish are cleaned and salted on the spot. The bank extends to the distance of twelve miles from the land in the latitude of Arzilla.

From Arzilla the coast still runs in the direction of S.W. half W.; and the shore presents nearly the same appearance. At four miles south of Arzilla the coast hills rise to 734 feet; and five miles farther, *Haffat-al-beida*, or the White Cliff, rises 308 feet above the sea. This is a remarkable cliff of white marl in the shape of a wedge, which presents the same form in all directions, and serves to identify this part of the coast. The section of this cliff which is presented shows the lines of strata generally at an angle of 70° with the horizon.

Al Araish is situated on the steep southern point of *Wad al Khos*, which here meanders through a rich and fertile valley: the numerous bends in this river have originated its name Al Khos, signifying in Arabic 'the bow.' A large castle on the summit of the hill, the lofty mosk towers, and fortifications, give this town an imposing appearance from the sea, which, however, vanishes as you approach, the whole then being little better than a heap of ruins. I was well received by the authorities, a guard of honour being

ready to conduct me to the governor, who received me, seated on a carpet spread under a shed; and though he studiously avoided inquiring the purport of my visit, still I was narrowly watched, and he was evidently jealous of it; and the poor Jew who acts as consular agent here, requested I would not use my instruments. On my expressing a wish to walk into the country, a guard was ordered to attend me; but notwithstanding this protection, whilst Lieutenant Kellett and myself were admiring the horse of a Moor, who was passing us, he suddenly wheeled round, and endeavoured to ride over us. He was immediately pulled from his horse by the soldiers, and severely chastised; but the circumstance shows the insecurity of Europeans amongst this barbarous people. The environs were laid out in gardens, from whence the town derives its name, Al Araish, signifying a pleasure garden; but they are in a wild and uncultivated state.

The only trade which this town at present possesses is with Gibraltar, but it is insignificant: there is no European residing here. The population of Al Araish is 2500,*—500 of which are soldiers, and 250 Jews; there are two brigs of war in the river, of about 250 tons; they have not been at sea for several years. There is between five and six feet water on the bar at the entrance of the river at low water, with a rise and fall of from nine to twelve feet high water, on full and change at 1h. 30m. Inside the bar the water deepens to twenty-four feet. To enter the river, bring the south point to bear E. half N. by compass; steer in this direction till across the bar, then pass the point as close as possible, and keep nearly in mid-channel till off the pier: the river there takes an abrupt turn to the left, and in this bend vessels moor. The best anchorage in the roads for vessels intending to enter the river is with a distant conical mountain, called Fez,† appearing in the centre of the entrance, one mile from the point, in twelve fathoms, sand. The south point is in latitude 35° 13′ N., longitude 0° 20′ 58″ W. of Tangier. The 'pap,' or rising ground, on the north side of the river, is 204 feet above the sea. About twenty miles to the southward is the outlet of a stream said to flow from a small lake. On the north point are several tombs kept well white-washed; the chief of them is named after *Muley Bú-Selham*, the old Mamora of our maps,

Though the coast is perfectly straight, there is anchorage off this river during the summer. Two cables' length from the bar of the river there is a depth of five fathoms, gradually increasing outwards to thirty-four fathoms at two miles off shore. The coast

* Gräberg de Hemsö, in his Specchio di Marocco in 1834, gives the population 4000. Washington, in Journal for 1830,—4000.

† Most probably the Jebel Sarsar of our maps, which is conical, and may be called Fas, either from lying exactly in the direction of that city, or from its shape resembling the red cap worn by the Moors,—and called Fas from a number being made there.—Ed.

between Al Araish and this spot is, for the most part, about 300 feet in height, reddish cliffs for the first ten miles, then sandhills partly covered with brushwood.

The town of *Mehediah* stands on the lower slope of a hill rising to the height of 456 feet, on the southern bank of the Wad Sebou, which flows round its base and here falls into the sea: it is surrounded by walls, and there is a fort apparently strong at that angle of the town which faces the entrance of the river. There is another fort on the beach immediately beneath, which was built by the Portuguese. Full half the space contained within the walls is clear of houses, and the population, we were told, was under 400. From the circumstance of the sea being discoloured at a considerable distance from the mouth of this river, we should be led to conclude that a very considerable body of water is discharged from it. In consequence of the determined hostility of the people, who fired on the boats whenever they approached the shore, I was prevented from minutely examining the bar; but as there was no surf whatever on it, it is probably deeper than the Wad al Khos. Both Chenier and Jackson consider it to be the largest river in West Barbary. There is at present no trade whatever in it. The people subsist principally by fishing; and it is famed for a fish called shebbel—in taste like salmon. There is good anchorage off the river during the summer. Two miles off shore there are sixteen fathoms water, muddy bottom. Ships approaching the land in the latitude of Mehediah will strike soundings in 100 fathoms, coarse sand, when distant twenty-one miles from the shore.

From Mehediah the coast runs in the direction of S.W. half W.; and generally resembles that before described. As you draw to the southward the country becomes much more level and wooded. The town of *Slá*, or *Sallée*, is situated on the northern bank, near the mouth of the river *Bu Regreb*. It is encompassed by a wall thirty-five feet high, strengthened and flanked by towers at regular distances; it is nevertheless weak, and could offer little resistance to a regular attack. At the south-west angle of the town there is a battery, mounting eighteen heavy guns, which commands the northern passage over the bar of the river. The town of *Rabatt* stretches along the southern bank of the river, and is considerably larger than Sallée. The streets are narrow and dirty; but many of the houses are large and commodious.

The fortifications towards the sea are of a recent date, and kept in tolerable order; the guns are of large calibre, but the batteries are badly situated, if intended to protect the entrance of the river, and if merely to defend the town towards the sea, are useless, as no landing could be effected at that point. The battery at the north-west angle of the town, and which commands the entrance of the river, mounts twenty-four guns. At a quarter of a mile to the southward along the cliffs there is a battery mounting eighteen

guns, and a quarter of a mile farther, another mounting twenty-four, at the end of the city wall towards the sea. The water is deep close to the shore, and a frigate might approach within a cable's length of the batteries. The nautical, or rather piratical, taste which formerly characterized these people seems entirely to have departed; at present I do not think there are more than a dozen boats in the river, and the only vessel of war is a corvette of eighteen guns, which has not been at sea for five years, and which would now have difficulty in getting over the bar. The sandbank, which has for many years been accumulating in the entrance of this river, rises so much in the centre as to be dry at low water, thereby forming two channels, in the northernmost of which there is the most water; that to the southward has only two feet, at low-water springs, in the deepest part, but there is a rise and fall varying from nine to twelve feet. From the anchorage in the roads the water shoals very gradually till close to the bar, when it suddenly drops from seven to two fathoms, more or less. There is almost invariably a heavy surf, which renders it very dangerous for boats.

The British Consular Agent here (a Jew) estimates the population of Sallée at 14,000,* and that of Rabatt at 24,000, but this seems to me over-rated. The export trade principally consists in wool. Here is a manufactory of carpets, the colours of which are beautiful, and the texture excellent, but being made for home consumption, they are generally long in proportion to their width. Here, as well as at Araish, the greatest attention was shown me by the authorities. Provisions, consisting of bullocks, sheep, poultry, fruit, and vegetables, were sent on board for the crew; and when I declined receiving them, the Governor assured me it was by command of the Emperor, and, if I would not accept them, it would be considered as a mark of disrespect.

The conspicuous tower of Beni Hasann, or Smā Hasann, is 180 feet in height, and stands on a cliff 70 feet above the level of the sea; it is situated to the south-east of the town, about a mile from the sea, and may be distinguished eighteen or twenty miles from the deck of a ship.

Following the coast to the south-west, twenty-eight miles from Rabatt is the little town of *Mansoria*, with the tower of its mosk 180 feet above the sea; and rather more than five miles farther that of *Fidallah*. Point Fidallah is in latitude 33° 44′ North, longitude 1° 35′ 32″ West of Tangier.

It is a rocky peninsular point, appearing like an island at a short distance. The bay formed by this peninsula, though small, is deep, and vessels might here find shelter from westerly winds; there is a depth of from five to six fathoms (sandy bottom) very

* Sallée 10,000, Rabatt 21,000, in Geographical Notice of Marocco, Vol. I. of Journal.

near the shore. The town is situated in the bight of the bay; at present there is no trade. A small body of cavalry are stationed here to keep the people of the neighbouring country in order, who are generally considered disposed to theft. From Rabatt to Point Fidallah there is no danger within a quarter of a mile of the shore; the bank of soundings extends to the distance of twenty or twenty-two miles from the land, the distance increasing as you proceed to the south-westward. From 160 fathoms (mud), the water shoals suddenly to eighty or ninety fathoms; between which depth and sixty fathoms it continues for many miles (sand and mud), decreasing to thirty fathoms three miles from the shore. The coast between these places slightly embays; the inland features scarcely vary in appearance; two lines of barren and gently undulating hills run nearly parallel to the coast; the distant hills are from four to six miles from the sea, the nearer not more than a mile, sloping gradually to the beach, which is generally sandy, with occasional patches of rock. The hills vary in height from 200 to 300 feet.

Dar-al-Beida, or the White House, eighteen miles from Fidallah, was formerly a place of importance, but has been suffered to go to decay. In consequence of disturbances in the neighbouring country, the fortifications have lately been repaired, and, at the time of my visit, one of the Emperor's sons, with a large body of cavalry under his command, resided there. The adjoining country is said to be exceedingly fertile, and there is an increasing trade in corn and wool. There is a British Consular Agent here, a Jew. From that part of the coast where the town is situated the land takes a sudden bend to the westward, terminating in a rocky cape, and forming a deep bay. This must be an unsafe anchorage during the winter, as the current here sets obliquely on the cape, rendering it almost impossible for a vessel to clear it with a westerly wind. A reef of rocks lies off the town at the distance of one-third of a mile; the landing-place is behind them, and the bottom is rocky in many parts of the bay.

Dar-al-Beida Cape is in latitude 33° 37′ North, longitude 1° 47′ 24″ West of Tangier. Rocks extend from it to the distance of nearly half a mile, and farther off there is a rocky bank having six fathoms water on it. Twenty miles west of the Cape soundings are obtained in 150 fathoms (dark sand): this depth decreases rapidly in approaching the land to forty-five fathoms twelve miles from the shore, then gradually to the beach.

The town of *Azamor* is situated on a sandhill 120 feet above the sea, at a short distance from the south bank of the river Um' er' biegh, or 'Mother of Herbage.' As we approached the town towards sunset it was refracted through the haze to quite a magnificent place; and it gave to a tomb, or sanctuary, in the centre of the town, the appearance of a cathedral: the reality displayed a mere

heap of ruins. I was informed by the British Consular Agent at Mazagan that the population of Azamor does not amount to more than 600 or 700 people;* these carry on a considerable trade in wool, which is shipped from Mazagan. The inhabitants of the province of Dukaila, in which this town is situated, are principally pastoral; their riches consist in large flocks of sheep and goats. There is no timber in the province. The country people principally live in tents. They are remarkable for their height.

A bar of sand, dry at low water, crosses the mouth of the Um' er' biegh; inside it is said to be deep and rapid.

Mazagan, situated on a low rocky point, twelve miles from Azamor, projects into the sea; the coast between is slightly indented, forming an extensive bay. It is in latitude 33° 16′ N., longitude 1° 16′ 22″ E. of Mogador. From the point a reef extends some distance in a northerly direction, which shelters the anchorage from westerly winds, but a heavy swell rolls in. The soundings in this little bay vary from two to six fathoms (mud), but at the depth of rather less than two feet below the mud there is a stratum of hard smooth stone, which renders it bad holding ground. In the larger bay the depth varies from ten to fifteen fathoms (fine dark sand), but it is a wild and insecure anchorage during the winter months.

Mazagan is well situated for defence nearly at the extremity of the point. It is a square, the sides of which are about 500 yards in length, encompassed by walls thirty feet thick, and thirty-five feet in height, and having half-moon bastions at each angle. There is a deep and broad ditch, on three sides faced with masonry, in which there is nine feet water at high tide; this ditch communicates with the sea, and serves as a dock for small vessels. A gate was opened on that side fronting the bay by the Portuguese, during the siege which ended in their expulsion, in 1769; the Portuguese cannon still remain on the walls.

The town is in a most ruinous state, and does not contain more than two hundred inhabitants, a large proportion of whom are Jews. There is a tank admirably constructed, which will contain several thousand tons of water. The principal magazines and soldiers' quarters, bomb proof, are still in tolerable repair. There is here a lofty building, 140 feet high, in ruins, which, from its construction, I imagine to have been a light-house. Mazagan, the last town which was possessed by the Portuguese in Marocco, was abandoned by them in 1769. A large proportion of the buildings in the town are now used as storehouses for wool, great quantities of which are shipped from hence.

Resuming the description of the coast: for three or four miles to the south-west of Cape Dar-al-Beida the beach continues rocky; a sandy beach then commences, and so continues the entire dis-

* Stated at 3000 by M. Gräberg de Hemsö, and also in Journal, Vol. I.

tance to Mazagan. Inland, two lines of hills, varying from three to four hundred feet in elevation, at the distances respectively of two to six miles from the beach, continue to Cape Azamor. They appear barren, and are very thinly clothed with stunted brushwood. From Azamor to Mazagan there is merely a line of low sand-hills.

Cape Blanco (north) is in latitude 33° 8′ North, longitude 8° 38′ West. About midway between it and Mazagan are the ruins of *Tett*, an ancient city; the extent of the walls may be traced by vestiges of numerous square towers which still remain, and a lofty tower, probably of Moorish construction, in a tolerable state of preservation, 128 feet high, and 148 feet above the sea. It serves to point out the position of the place from a long distance. Two large tombs, kept fresh whitewashed, stand on either side of it. The coast between Mazagan and Cape Blanco, north, should not be approached nearer than a mile and a half, as scattered rocks lie off the shore, and the soundings are very uneven. The beach, though in some places sandy, is generally lined with craggy rocks. A barren line of hills, 200 feet above the sea, slope to the beach the entire distance. These hills terminate just to the northward of the Cape in a low, dark, but abrupt and rocky cliff. Cape Blanco no doubt derives its name from a white cliff, 170 feet high, a little to the southward of the real headland which forms the cape. It appears of white sandstone, and the lines of strata rising for some distance parallel to the horizon, suddenly drop nearly at a right angle to the water. At twenty-two miles to the westward of the Cape soundings will be obtained in 150 fathoms (fine sand), gradually decreasing to twenty-eight fathoms four miles from the shore. In nearly all the charts of the coast of Marocco hitherto published, an island called Duksal is represented four miles south of the Cape; it does not exist, but there is a dark, and rather projecting cliff, which has somewhat such an appearance. About six miles to the southward of Cape Blanco (north) the hills rise gradually from the beach to the height of 465 feet; this is the highest front land on the coast of Marocco. Here are the ruins of a town. *El Waladia* is in this neighbourhood; and there is said to be 'a very extensive harbour or lake, the entrance to which is obstructed by a rock or two, which might be blown up, and thereby render this one of the finest harbours in the world.' No entrance could be found by the boats of the Ætna; nor do I think it probable, did such a harbour as is described exist, that the Portuguese, who possessed so many places on the coast, would have neglected it.* At the respective

* An expanse of water, extending at times a long distance to the north-east, certainly does here exist;—that it has communication with the sea at all times seems doubtful; but Mr. Chaillet, formerly British Vice-Consul at Mogador, states that he rode along its banks in 1830, and that he was told positively that communication with the sea did exist. Jackson says the same.—Ed.

distances of four and seven miles to the southward of the ruins are two small and ancient-looking walled towns, situated on the edge of the cliff, which I imagine to be the Eder and Teturia of some maps. Four miles to the northward of Cape Cantin, the profile of the land, which is here 450 feet above the sea, begins to slope gently till it again rises into a hillock just inside the Cape. On the outer edge of the hillock is a white patch, seen both from the northward and southward, perhaps the site of the ancient town of Conte. A singular-looking gap, in the profile of the Cape itself, presents also the same appearance from both directions.

Cape Cantin, or *Ras al Hudík*,* rises precipitously 211 feet above the sea; in approaching it from the westward, when at the distance of sixteen miles, you will obtain soundings in 100 fathoms (fine sand); this depth decreases gradually to the Cape, which may be approached within any convenient distance. The Cape is in latitude 32° 32′ 27″ N., longitude 0° 24′ 58″ E. of Mogador; this is several miles to the westward of its present assigned position.

The *North Cape* of the bay of *Saffi* bears S. 4° W., fourteen miles from Cape Cantin. It forms into two headlands, and on the southern one there is a tomb, or sanctuary. The coast between Cape Cantin and the southern projection of Cape North is one continued white cliff, with a sandy beach at its base. The cliff, which gradually increases in height, is at the southern projection, 530 feet above the sea. Here the land receding very much, forms a deep bay, in the bight of which the cliff terminates at a ravine, the bed of a winter torrent; on the slope of the hill on the south side of this ravine stands the ancient town of *Saffi*. It is a place of considerable size, surrounded by a wall thirty-one feet high, and a ditch on three sides, which is, however, filled up in many places; the high tower of a mosk is 209 feet above the sea. On the fortifications fronting the sea there are twenty-four heavy guns mounted. Water is scarce, and during the summer has to be procured from wells, which were dug by the Portuguese a short distance to the southward of the town. The country in the neighbourhood is sandy and barren. The consular agent at Saffi is a Moor, and is the only native we have in that capacity.

At the very time I was having an interview with the governor several officers arrived, and made their reports, which I discovered afterwards related to ourselves: these persons having been employed to observe and report on my proceedings since our leaving Rabatt. As an instance of the importance which the Moors attach to salutes, when I was on the point of stepping into my boat the consular agent very civilly said, that the governor would feel gratified if I would pay that compliment previous to sailing, as it

* Ras al Hudík—Cape of the Palm Groves, or Grove Cape.—Gräberg de Hemsö.

tended to augment his importance with the people. I of course complied with his request. Notwithstanding the simple manners of these people, a love of military parade is very apparent; indeed I had been cautioned by the British Consul General at Tangier, Mr. Drummond Hay, not to be sparing of gunpowder.

The population of Saffi has been gradually decreasing, and at the present time, I was informed, did not amount to more than from eight to nine thousand;* this is no doubt to be attributed to the almost entire falling off in the trade of the place. The bay, during the summer months, or from March to October, affords as good anchorage, and smoother water than any other on the coast, but is entirely exposed to westerly winds; the bottom is sand and mud, and there is generally about fifteen fathoms water a mile from the shore. At seven miles south of Saffi, a red cliff, probably Sharf al Yudi, or Jew's Cliff of our maps, rises to 284 feet above the sea.

From Saffi the coast runs nearly in the direction of S. ¾ W., sixteen miles to the Wad Tensift, or River of Marocco; presenting generally a line of sandhills from 150 to 200 feet high; these in some places terminate in low cliffs, in others slope to the beach. Inland there is a ridge of sandy-looking hills, covered with brushwood, the highest part of which is 650 feet above the sea. Nearly midway between Saffi and the river Tensift there is a large tank, which was built by the Portuguese.

The *Wad Tensift*, though doubtless a very considerable river in the interior, at this season of the year (August) has its bar entirely dry at low water. On the southern bank of the river there is an old castellated building, square and roofless. It was built for the accommodation of travellers.

From the Tensift the coast runs in the direction of S. 40° W. thirty-three miles, to a low sandy point, which projecting suddenly forms a little bay to the northward, full of rocks, which however do not extend more than half a mile from the beach. There are some tombs, and the ruins of a town (probably Akkarmute), in the bight of the bay, at the base of the Iron Mountains. The coast, which from the Tensift is barren and uncultivated, and from 200 to 300 feet in height, here shows signs of fertility and cultivation. The lofty *Jebel Hadid*, or *Iron Mountains*, a mass of high land, extending more than twenty miles in length, here rises to the height of 2250 feet; another height nearer the sea, and having a tomb on its summit, a conspicuous object from a great distance, is 2100 feet above the sea.

From the reef point a sandy beach continues in the direction of S. 21° W., twelve miles to Mogador; the prospect inland being

* Specchio di Marocco, 12,000.

bounded by the *Botof* sandhills, which are at the distance of one mile from, and run parallel to, the beach.

The survey here terminates*; and if this narrative should be found deficient in geographical information, it must be laid to the account of the rapidity with which it was absolutely necessary to carry on the operations, and the very few opportunities afforded of communicating with the shore.'

As the currents have been assigned as the principal cause of the many shipwrecks which have occurred on this coast, it will be necessary to make a few remarks on them in conclusion.

During five months (from March till August), the time occupied in the survey of the coast from Cape Spartel to Cape Bojador, a distance of 750 geographical miles, no day passed in which the ship was not at least twelve hours at anchor, usually at the distance of from four to five miles from the shore, and consequently in positions well adapted for making observations on the currents, and which were constantly attended to. Independently of this, the Raven cutter was repeatedly sent to the distance of twenty and thirty miles from the land; particularly when fixed and conspicuous objects in the triangulation afforded opportunities for ascertaining her exact position: by comparing which with that which should have been given by the course steered, errors excluded, the rate and direction of the current could be ascertained to a considerable degree of exactness.

From Cape Spartel, along the coast to Arzilla, and also to the distance of seven or eight miles from the shore, a regular tide was experienced, running parallel to the coast; its strength, however, being rather greater to the northward than to the southward. In this distance, at fifteen miles from the land, no tide or current was perceptible in any direction.

From Arzilla southerly a tide was still experienced gradually diminishing in strength till its direction could not be ascertained. From the parallel of 34° 30′ N. to the distance of twenty miles in the offing, a steady southerly set was first experienced. This current in the offing continues invariably to follow the direction of the land; its velocity increasing or diminishing, from the rate of four-tenths to one mile per hour, according to the strength or continuance of the north-easterly winds.

No 'sargasso,' or other weed, was at any time found to accompany this current.

* * * *

The original chart of this survey is laid down on the scale of one inch to a mile, minutely detailing all the features of the coast, and the soundings; and it is from this the accompanying sketch chart is reduced.

XVII.—*Sketch of the Surveying Voyages of his Majesty's Ships Adventure and Beagle,* 1825–1836. Commanded by Captains P. P. King, P. Stokes, and R. Fitz-Roy, Royal Navy. Communicated by Sir John Barrow, Bart.

The best charts of the South American coasts, which had been made by Spain, or by Portugal, were very inadequate to the wants of a rapidly growing intercourse when France and England undertook to explore and survey those shores for the benefit of the world. The French examined the coasts of Brazil; the English those of Patagonia, Tierra del Fuego, Chile, and Peru. In 1825, two vessels, the Adventure, 330 tons, and the Beagle, 235 tons, were ordered to be prepared. Captain Philip P. King was appointed to the former, and charged with the direction of the expedition. Captain Pringle Stokes commanded the latter. They sailed from England in May, 1826.

Part of Eastern Patagonia, the greater portion of the Strait of Magellan, and a considerable extent of the western shores of Patagonia, had been examined, when the death of Captain Stokes caused a suspension of operations. Lieutenant Skyring, whose life has since been sacrificed, was temporarily appointed to the Beagle by Captain King, but soon afterwards superseded by the commander-in-chief on the station; who placed the writer of this sketch in the vacancy. During 1829 and 1830 the two vessels continued the survey, assisted by a tender, whose commander was Lieutenant Thomas Graves. In the latter part of 1830 they returned to England, having added charts of the south-western and southern shores of Tierra del Fuego, besides those of a multitude of interior sounds and passages, to the acquirements above mentioned. Information of other kinds, interesting to men of science, and to most people, was also acquired, and will be made accessible without more delay than is absolutely necessary. A paper on this subject, written by Captain King, was read before the Royal Geographical Society of London, in May, 1831. In the autumn the Beagle was again prepared for a surveying voyage. Every care and assistance was given in her equipment. She wanted nothing that her size would allow to be taken on board. At the end of that year (1831) she sailed from Plymouth. One particular object being the measurement of meridian distances, by a large number of chronometers, the Beagle was ordered to make her voyages by the shortest steps, touching land frequently, for the purpose of obtaining observations and ascertaining the rates of the chronometers. Until the vessel arrived in the River Plata, her chief occupations were, measuring meridian distances, and slightly adding to our knowledge of the Abrolhos shoals, on the coast of Brazil.

While the officers of the Beagle were employed in their usual duties afloat, Mr. Charles Darwin, a zealous volunteer, examined the shores. He will make known the results of his five years' voluntary seclusion and disinterested exertions in the cause of science. Geology has been his principal pursuit.

Beginning with the right or southern bank of the wide river Plata, every mile of the coast thence to Cape Horn was closely surveyed and laid down on a large scale. Each harbour and anchorage was planned;—thirty miles of the River Negro, and two hundred of the Santa Cruz, were examined and laid down, and a chart was made of the Falkland Islands. These earlier productions of the Beagle's voyage are now in the engraver's hands.

Before going westward of Cape Horn it should be remarked, that the detailed survey of so much coast in a short time was accomplished by the constant exertions of Lieutenant John C. Wickham, Mr. J. L. Stokes, and Mr. A. B. Usborne; who ran every risk, and worked by night as well as *every* day, in two small decked boats, during the first year, and afterwards in a tender. The Beagle took portions of coast towards the south, while her detached party were at work between Port Desire and Blanco Bay, and afterwards at the Falkland Islands.

Westward of Cape Horn, as far as the parallel of forty-seven south, little has been added to the results of the Beagle's first voyage, because nearly enough was then done for the wants of vessels employed in, or passing through, those dreary regions; and because there were so many other demands upon the surveyors which were of more consequence. Between forty-seven south latitude and the River Guayaquil, the whole coasts of Chile and Peru have been surveyed; no port or roadstead has been omitted.

Of the Chonos Archipelago, no chart existed. Of Chiloe, the Spanish charts were twenty-five miles in error, in *latitude*. Of the other coasts, a mixture of bad and good description alternately plagued or assisted. Wherever the eyes of Malaspina, Espinosa, or Bauza, reached, in the expedition of the Atrevida and Descubierta, there the old charts are correct; but the intermediate details are not to be compared with those resulting from *their* labours, nor with those in the vicinity of Lima, executed by the students at the Nautical School, under the direction of Don Eduardo Carrasco and his predecessors. Half the coast of Chile was surveyed *in detail*, by Lieutenant B. I. Sulivan, in a small schooner, *lent* for the purpose by Don Antonio José Vascuñan, of Coquimbo; and all the coast of Peru was afterwards closely examined and laid down, by Mr. A. B. Usborne, in the same vessel, then purchased from her public-spirited owner, and fitted out by the Beagle. Mr. Usborne's survey was carried on while

the Beagle was examining the Galapagos* islands, traversing the Pacific Ocean, and returning to England by the way of the Cape of Good Hope.

Traced copies of the charts of coasts adjacent to Buenos Ayres, of the *whole* coast of Chile, and of the greater part of the shores of Peru, were given to the respective governments of those countries before our vessels left their territories,—and long before the original documents could reach England.

Four years having elapsed since the Beagle left England, and having yet three-quarters of the globe to traverse, the little vessel left South America and hastened to that classical spot, Otaheite. Her route was through the Dangerous Archipelago, in which two, if not three, new islands were discovered. Krusenstern's charts and directions were there the only ones of any use. At Otaheite (or Tahiti), a manuscript chart of that really dangerous labyrinth and some useful information were obtained from an intelligent Englishman, who had passed several years in trading with the natives of those numerous low coral islands.

Meridian distances being now the principal object, all haste was made from place to place, and without more delay at any one spot than was absolutely necessary for making observations. Nearly a week, on an average, was passed at each of the following places:—Tahiti, New Zealand (Bay of Islands), Port Jackson (Sydney), Van Diemen's Land (Hobart Town), King George's Sound, the Keeling Islands, Mauritius, Cape of Good Hope, St. Helena, Ascension, Bahia (in Brazil), Pernambuco, Cape Verd Islands, and Azores. At Falmouth the Beagle arrived in the beginning of October; thence she went to Plymouth, Portsmouth, and Greenwich. Directly the rates of her chronometers are ascertained she will go to Woolwich, and there be paid off.

Mr. Usborne has returned from Peru by the way of Cape Horn. His little vessel, of only thirty-five tons burthen, was sold at Paita, when done with, for more than her first cost.

Having thus attempted to give a general idea of the means employed, and course pursued, during these voyages, a few sketches of those places less known, or more interesting than others, will be added.

Those almost boundless plains southward and westward of Buenos Ayres have been too often and too well described to require another word. As pasture land they are excellent, except in the summer, when all is parched. There is a rich tract of country between Buenos Ayres and Cape Corrientes, where the soil is rich and water plentiful. In that tract there are ranges of low hills, running nearly east and west.

* Pronounced Gălăpăgŏs.

From Blanco Bay to the river Negro is a dangerous place. The land is every where low; there are many and extensive shoals and strong tides. Yet with a pilot, or correct chart, excellent harbours may there be reached—in which navies might rest in safety.

In Blanco Bay (the best of these harbours) there are from eight to twelve feet rise of tide. If *large* ships ever frequent that part of the coast, there must be their asylum. But there are material objections to the surrounding country. Water is extremely scarce; wood is not to be procured, except at a great distance.

Unfortunately the fine river Colorado, which rises near Mendoza and brings down a great quantity of water throughout the year, does not run into any of the numerous ports near its opening. A canal might join it to Union Bay, without much difficulty; but does the river remain in one place many years? Do not high tides, floods, and gales of wind alter it annually?

Low, level land extends southward to the river Negro, and westward *gradually* rising towards the Cordillera of the Andes. Villarino, in his Diary, describes the Negro;* it cannot be safely used by vessels drawing more than ten feet water, because there is a dangerous shifting bar at the entrance. South of this river the country and coast change their character; ranges of stony hills, extensive barren plains, and steep cliffs, extend hence to the Strait of Magellan. Only here and there, close to the little river Chupat, or in an occasional oasis, does a tree or green herbage appear. Mixtures of brown, yellow, and light red tire the eye.

One naturally asks why Eastern Patagonia should be condemned to perpetual sterility—while the western side of the same country, in the same parallel of latitude, is injured by too much rain? The prevailing westerly winds, and the Andes, are the causes. The winds bring much moisture from the Pacific, but they leave it all (condensed) on the west side of the mountains. After passing the Cordillera, those same winds are very dry. Easterly winds are very rare upon the east coast: they are the only ones which carry rain to the almost deserts of Patagonia. *Westward* of the Andes, an *east* wind is *dry* and free from clouds. All this country is exposed to severe cold in winter, and to excessive heat in summer; great and sudden changes of temperature take place when, after very hot weather, cold winds rush northwards with the fury of a hurricane. Even the wandering Indians avoid this region, and only cross it to get salt, or visit their burying-places.

In a twenty days' excursion up the river Santa Cruz, we passed through a similar country, without variety, until extensive beds of lava were found overlying the whole country. These Mr. Darwin

* Inserted at p. 136 of this volume.

has already described. We reached nearly to the eastern flank of the Andes, but for want of provisions could go no farther. The river was then, at 200 miles from its mouth, almost as large and quite as rapid as at twenty miles from the sea. Perhaps it runs, for a great distance, along the base of the Andes, and so collects a great body of water; or it may run from a lake into which streams pour. Its water is not muddy. The current runs six knots; none of our boats could pull against it anywhere. We tracked them (pulled them along by a rope). Its *average* width is 200 yards, and mean depth ten feet; perhaps more.

The Gallegos is another rapid torrent; but its size and length do not nearly equal those of the Santa Cruz.

On the coasts adjacent to these rivers the tide rises very much, not less than forty feet at spring tides.

The aboriginal natives of Patagonia are a tall and extremely stout race of men. Their bodies are bulky; their heads and features large; but their hands and feet are small. Their limbs are neither so muscular nor so large-boned as their height and apparent bulk would induce one to suppose: they are rounder and smoother than those of white men. Their colour is a rich reddish brown, rather darker than that of copper, yet not so dark as good mahogany.

Nothing is worn upon the head except their rough, lank, and coarse black hair, which is tied above the temples by a fillet of plaited or twisted sinews. A large mantle, made of skins sewed together, loosely gathered about them, hanging from the shoulders to their ankles, adds so much to the bulkiness of their appearance, that one ought not to wonder at their having been called gigantic.

I am not aware that any Patagonian has appeared during late years whose height exceeded six feet and some inches; but I see no reason to disbelieve the Jesuit Falkner's account of the Cacique Cangapol, whose height, he says, was seven feet and some inches. When Falkner stood on tiptoe he could not reach the top of Cangapol's head. It is rather curious that Byron could only just touch the top of the tallest man's head whom he saw. Ever restless and wandering as were the Tehuel-het, of which tribe he was cacique, might not Byron have measured Cangapol?* Who disbelieves that the Roman Emperor Maximinus, by birth a Thracian, was more than eight feet high?—yet who, in consequence, expects all Thracians to be giants?

Among 200 or 300 natives of Patagonia, scarcely half-a-dozen men are seen whose height is under five feet nine or ten inches: the women are proportionably tall.

I have nowhere seen an assemblage of men and women whose *average* height and *apparent* bulk equalled that of the Patago-

* Dates agree sufficiently.

nians. Tall and athletic as are many of the South Sea islanders, there are also many among their number who are slight, and of lower stature.

The Patagonians seem to be high-shouldered, owing, perhaps, to their habit of folding their arms (across the chest) in their mantles, and thus increasing their apparent height and bulk, because the mantles hang loosely, and almost touch the ground. Until actually measured, it is difficult to believe that they are not much taller than is the case.

But little hair grows on their faces or bodies: from the former it is studiously removed by two shells, or some kind of pincers.

Although they do not try to improve their coarse features by piercing either nose or lips, they disfigure themselves not a little by red, black, or white paint, with which they make grotesque ornaments; such as circles around their eyes, or great marks across their faces. Upon particular occasions all the upper part of their body is queerly decorated by daubs of paint.

On their feet and legs are boots made out of the skins of horses' hind-legs. Wooden (if they cannot get iron) spurs, sets of balls,* a long, tapering lance, and a knife (if one can be procured), complete their equipment.

The women are dressed and booted like the men, with the addition of a half-petticoat. They clean their hair, and plait it into two tails. Ornaments of brass, beads, bits of coloured glass, or such trifles, are prized by them.

Mounted upon horses of a middle size, under fifteen hands high, and rather well bred, the Patagonians seem to be carried no better than dragoons who ride eighteen stone upon horses able to carry ten; yet they go at full speed in chase of ostriches or guanacoes. When hunting, or making long journeys, they often change horses.

The huts of these wanderers are somewhat like gipsy tents. Poles are stuck in the ground, to which others are fixed. Over them are thrown the skins of animals. An irregular, tilt-like hut is thus formed.

The north-eastern part of Tierra del Fuego is like Patagonia. The natives, also, are like those above mentioned, but they have no horses. Balls, bows and arrows, and clubs are their arms and hunting weapons. Seal, guanacoes, and birds are their principal subsistence.

The eastern portion of Tierra del Fuego is a better country than any south of forty-five. The wooded mountains of the west there sink into hills, and those again into level land, partially wooded. The climate is a mean between that of Eastern Patagonia and Western Tierra del Fuego.



* *Bolas*, Spanish. Two or three balls connected by a thong of hide, which they throw at animals or men, to entangle and disable them.

Whenever a settlement is made in those regions, St. Sebastian Bay will be found to possess several advantages.

The southern and western part of Tierra del Fuego may be briefly described by saying that deep but narrow arms of the sea intersect high, mountainous islands, whose summits are covered with snow; while their steep and rocky shores are more than partially covered with evergreen woods.

Throughout the year, cloudy weather, rain, and much wind prevail. Fine days are rare. Frost and snow are constant on the mountains; but near the level of that great climate agent, the ocean, whose temperature is there never below forty-five degrees of Fahrenheit, neither one nor the other are nearly so troublesome as one might expect in so high a southern latitude, among snow-covered mountains, whose sight is enough to make one shiver.

The wretched natives of Southern and Western Tierra del Fuego are low in stature, ill-looking, and ill-proportioned. (I speak of them *generally* in their savage state.)

Their colour is darker than that of copper; it is like old mahogany, or rusty iron. The trunk of their body is large in proportion to their cramped and rather crooked limbs. Rough, coarse, and extremely dirty black hair, half hides, yet heightens, a villainous expression of ugly features.

Sometimes these outcasts wear a piece of seal, otter, or guanaco skin upon their backs; and perhaps the skin of a penguin, or some such covering, is used in front; but often nothing is worn except a scrap of hide, which is tied to their waist. Even this is only for a pocket in which they may carry pebbles for their slings.

Passing so much time in low wigwams, or cramped in small canoes, injures their limbs and movements. In height they vary from four feet ten to five feet six inches; yet the size of their bodies equals that of our largest men. Of course they look clumsy and ill-proportioned. Women usually wear more covering, perhaps a whole skin of a seal. The women comb their hair with the jaw of a porpoise. Both sexes oil themselves, or rub their bodies with grease. They paint, or rather daub their faces and bodies with red, white, or black.

Perhaps Freycinet, and those with him, saw some of these people painted black, as Bory St. Vincent quotes their authority for the natives of Tierra del Fuego being *black*, like the natives of Van Diemen's Land.—See article "Homme" in the *Dictionnaire Classique.*

As a Fuegian is seldom out of sight of his canoe, or a wigwam, a slight idea of those, his only constructions, should be given.

The canoe is made of several large pieces of bark sewed together. Its shape is nearly that which would be taken by the strong bark of a tree (twelve to twenty feet in length, and eighteen inches, or

two feet in diameter), separated from the solid wood in one piece, joined at the ends, but kept open by sticks in the middle. It is ballasted by clay, and always carries a small fire.

There are two kinds of wigwams: one is made with a number of small straight trees, whose upper ends are united, while the lower form a circle; and another which is formed by branches stuck in the ground, bent together at the top, and slightly covered by skins, bark, grass, or leafy twigs. A small entrance is left open: smoke goes out as easily as rain enters.

Western Patagonia is like the worst part of Tierra del Fuego. It is the upper part of a great range of mountains, whose bases are immersed in the ocean. The mountain-tops form multitudes of islands, barren to seaward, but impenetrably wooded towards the main-land; and always drenched with the waters of incessant rain, *never* dried up by evaporation. Every foot of earth, every tree, and shrub, on those islands, is *always* thoroughly wet. Of course the country is uninhabitable, except by savages. Clouds, wind, and rain only cease their annoyance during the very few days on which the wind is easterly, or perhaps southerly. Probably there are not ten days in twelve months, on which rain (or snow) does not fall; and not thirty on which it does not blow strongly. But it is mild, and the temperature is surprisingly uniform throughout the year.

The Chonos Archipelago is very little better than the country just mentioned. It is almost uninhabitable. Indeed, on the west coast of South America, southward of Chiloe, there are very few acres of land capable of cultivation, and no place which is fit for the permanent abode of civilized man. That inhospitable region should be avoided by ships; though really full of harbours, it is so dangerous to run to leeward, and so difficult to make out the land, obscured as it is generally by rain or clouds, that most of them must ever be nearly useless. A heavy swell always sets towards the shore; and, although there are no sand-banks, there are numbers of outlying, dangerous rocks.

Steam navigation may render the numerous interior passages useful. From the north end of Chiloe to the eastern entrance of Magellan's Strait a steamer may go without being exposed to the swell of the Pacific, except at one place, Cape Tres Montes. In that interval she may get fuel (wood) on either hand, wherever she chooses. On the main-land, opposite to Chiloe, are the southernmost volcanoes of whose modern activity we have any certain account. There are four in sight of the inhabitants of Chiloe. Each one, even when tranquil, is a magnificent object.

None of the mountains in this part of the Andes, or to the southward, which have been measured, exceed 9000 feet in height.

Chiloe, though a fertile island, is exposed to an excessive amount of wind and rain. It is the southernmost inhabited part of the west coast.

About Valdivia the climate is similar, and must always be an obstacle to cultivation. Northward of Valdivia, towards Concepcion, is one of the finest countries in the world, in a very healthy climate. There the Araucanians are still unconquered owners of their native land. All the efforts of the Spaniards, all exertions of their descendants in Chile, have failed in expelling that heroic race from the birthplace of their ancestors.

That they should now make head against the Chilenos, is not surprising; but that they should formerly have withstood the power of Spain, and the enthusiasm of their invaders, excites astonishment.

Gold is often supposed to have been the principal temptation of the early conquerors of the New World: but there was another motive for energetic exertion, one which affected many minds far more than the desire of wealth. An enthusiastically religious feeling urged them to persevere under every trial and disappointment. It helps much in accounting for the wonderful hardiness and constancy shown in discovering, exploring, and conquering all but Araucania.

A high sentiment of religion, urging them to conquer, in order to convert to Christianity, and to honour God, by honouring their king, was a powerfully impelling motive in the minds of those leaders who first opened the roads which crowds of inferior men afterwards followed.

While the Beagle was at Valdivia, the great earthquake of the 20th of February, 1835, took place.

Concepcion, February 20th.—At ten in the morning very large flights of sea-fowl were noticed passing over the city of Concepcion, from the sea-coast towards the interior. In the minds of old inhabitants, well acquainted with the climate of Concepcion, some surprise was excited by so unusual and so simultaneous a change in the habits of those birds,* no signs of an approaching storm being visible, nor any expected at that season. About eleven the southerly breeze † freshened up as usual; the sky was clear, and almost cloudless. At forty minutes after eleven ‡ a shock of an earthquake was felt, slightly at first, but increasing rapidly.§ During the first half minute many persons remained in their houses; but then the convulsive movements became so strong, that the alarm was general, and all rushed into the open spaces for safety.

* Chiefly gulls. † Sea-breeze.

‡ Mean time.—Equation, 14′ subtractive from mean time.

§ No noise preceded the *great* shock.

The horrid motion increased; people could hardly stand; buildings waved and tottered; suddenly an awful overpowering shock caused universal destruction.' In less than six seconds the city was in ruins. The stunning noise of falling houses; the horrible cracking of the earth, which opened and shut rapidly and repeatedly in numerous places;* the desperate, heart-rending outcries of the people; the stifling heat; the blinding, smothering clouds of dust; the utter helplessness and confusion, and the extreme horror and alarm, can neither be described nor fully imagined.

This fatal convulsion took place about a minute and a half, or two minutes, after the first shock; and it lasted equally violent during nearly two minutes. During this time no one could stand unsupported: people clung to each other, to trees, or to posts. Some threw themselves on the ground; but there the motion was so violent, that they were obliged to stretch out their arms on each side, to prevent being tossed over and over. Horses, and all animals, were greatly frightened, standing with their legs spread out, and their heads down, trembling violently. Birds flew about wildly.

After the violent shock had ceased, the clouds of dust, which had been raised by the falling buildings, began to disperse. People breathed more freely, and began to look around them. Ghastly and sepulchral was their appearance: had the graves opened and given up their dead, the sight would have been scarcely less shocking. Pale and trembling, covered with dust and perspiration, they ran from place to place, calling for their relations and friends. Many seemed to be quite bereft of reason.

Considerable shocks continued at short intervals, harassing and alarming. The earth was never long quiet during that or the next day; nor, indeed, during the three days following the great shock.

For many hours after the ruin the earth was tremulous, and the shocks were very frequent, though not severe. Many shocks, but not all, were preceded by a rumbling, subterranean noise, like distant thunder: some compared the sound to the distant discharge of many pieces of artillery. These sounds came from the south-west quarter, and preceded the shock by one or two seconds. Sometimes, but not often, the sound was heard unaccompanied by any shock.

It was the general opinion that the motion was from south-west to north-east. Some whole walls, whose direction was south-east and north-west, were laid flat; the bricks still maintaining their relative position, though endwise, without being *scattered* upon the ground. These walls fell, without exception, to the north-east.†

* The direction of these cracks was not uniform, though *generally* south-east and north-west.

† The streets of Concepcion lie north-east and south-west,—north-west and south-east.



Other walls were scattered as they fell; but the greatest masses of brick-work were thrown towards the north-east. Walls standing in the opposite direction, north-east and south-west, suffered far less. Fragments were shaken, or torn off; and some of the walls very much cracked;* but others had suffered little.

Roofs fell in everywhere: houses built of *adobes*† fell into a confused heap. The cathedral, whose walls are four feet in thickness, supported by great buttresses, and built of good brick and mortar,‡ suffered *more* than other buildings. Adhering to the remains of the walls were left the lower parts of some buttresses, theupper parts of others; while in one place a buttress stood on its own foundation, separated entirely from the wall.

The city of Concepcion stands upon a plain very little higher than the level of the river Bio-Bio: the soil is loose and alluvial. To the eastward and northward are rocky, irregular hills, of tertiary § formation. From the foot of these hills the loose earth was everywhere parted by the great convulsion, great cracks being left from an inch to a foot in width. It seemed as if the low land had been separated from the hills, having been more disturbed by the shock.

Women washing in the river near Concepcion were startled by the sudden rise of the water from their ankles to their knees, and at the same moment felt the beginning of the convulsion. It was said that the dogs avoided the ruin by running out of the way before the shock. This, though certainly known to have been the case at Talcahuano, wants confirmation with respect to Concepcion. Of nine men who were repairing the inside of a church, seven were killed, and two severely hurt. One of these poor fellows lay half buried in the ruins during five days, with a dead body lying across him, through which it was necessary to cut for his release. A mother escaping with her children saw one fall into a hole: a wall close to her was tottering; she pushed a piece of wood across the hole, and ran. The wall fell, and covered the hole with masses of brick-work. Next day the child was taken out unhurt. Another woman missed a child; saw that a high wall was tottering, but ran for her son, and brought him out. As she crossed the street the wall fell; but they were safe. When the tremendous crash came, the whole street, which she had just crossed, was filled up with part of the ruins of the cathedral. Besides a waving or undulatory movement, vertical, horizontal, and circular or twisting motions were felt. An angular stone pinnacle was particularly noticed, which had been turned half round without being thrown down, or leaving its base.

* Vertically,—as if by the undulatory movement of the earth's surface,—in the direction of their length.

† Large unbaked bricks. ‡ Both bricks and mortar were excellent.

§ Not quite certain.

Persons riding at the time of the great shock were stopped short,—some, with their horses, were thrown to the ground, others dismounted, but could not stand. So little was the ground at rest after the great ruin, that between the 20th of February and the 4th of March more than 300 shocks were counted. Much misery was alleviated by the good conduct and extreme hospitality of the inhabitants of Concepcion. Mutual assistance was everywhere rendered, and theft was almost unknown. The higher classes immediately set people to work to build straw-covered huts, and temporary houses of boards, living meanwhile in the open air under trees. Those who soonest obtained or contrived shelter collected all about them whom they could assist, and in a few days had a temporary shelter, under which they tried to laugh at their misfortunes, and the shifts to which they were reduced.

Talcahuano, Feb. 20th, 1835.—At Talcahuano the great earthquake was felt as severely as in the city. It took place at the same time and in a precisely similar manner. Three houses only, upon a rocky foundation, escaped the fate of all those standing upon the loose sandy soil which lies between the sea-beach and the hills. Nearly all the inhabitants escaped uninjured, but they had scarcely recovered from the sensations of the ruinous shocks, when alarm was given that the sea was retiring! Penco* was not forgotten: apprehensive of an overwhelming wave, all hurried to the hills as fast as possible.

About half an hour after the shock, when the greater part of the population had reached the heights, and the sea had retired so much that all the vessels at anchor, even those which had been lying in seven fathoms water, were aground; and all the rocks and shoals in the bay were visible;—an enormous wave was seen forcing its way through the western passage which separates Quiriquina Island from the main land. This immense wave passed rapidly along the western side of the bay of Concepcion, sweeping the steep shores of every thing movable within thirty feet (vertically) from high-water mark. It broke over, dashed along, and whirled about the shipping as if they had been light boats, overflowed the greater part of the town, and then rushed back with such a torrent, that almost every movable, which the earthquake had not buried under heaps of ruins, was carried out to sea. In a few minutes the vessels were again aground, and a second great wave was seen approaching, with more noise and impetuosity than the first. Though this wave was more powerful, its effects were not so considerable, simply because there was less to destroy. Again the sea fell, dragging away quantities of wood-work, and the lighter materials of houses, and leaving the shipping aground.

After some minutes of awful suspense, a third enormous swell

* Penco, the former capital of the province of Concepcion, was overwhelmed by the sea.

was seen, between Quiriquina and the main land, apparently larger than either of the former waves. Roaring, as it dashed against every obstacle, with irresistible force it rushed along the shore, destroying and overwhelming. Quickly retiring, as if spurned by the foot of the hills, the retreating wave dragged away such quantities of household effects, fences, furniture and other movables, that, after the tumultuous rush was over, the sea appeared covered with wreck. Exhaustion appeared to follow these efforts. Earth and water trembled. Numbers of the inhabitants now hastened to the ruins, anxious to ascertain the extent of their losses, and to save some money, or a few valuable articles, which, having escaped the sweep of the sea, were exposed to depredators.*

During the remainder of the day and the following night, the earth was not quiet many minutes at a time. Frequent, almost incessant tremors, occasional shocks, more or less severe, and distant subterranean noises, kept every one in anxious suspense. Some thought the crisis had not arrived, and would not descend from the hills into the ruined town. Others, searching among the ruins, started at every shock, however slight, and almost doubted that the sea was not actually rushing in again to overwhelm them. Nearly all the inhabitants, excepting a few who went on board vessels in the harbour, passed the night upon the hills without shelter.

Next day they began to raise sheds and huts upon the high grounds, still dreading the sea. Without explanation, it appears astonishing how the shipping escaped destruction. Three large whale ships, a bark, two brigs, and a schooner, were lying very near the town in from four to seven fathoms water. They were lying at single anchor,† with a good scope of cable.‡ With the southerly breeze, which was rather fresh at the time of the earthquake, the vessels were lying to seaward§ of their anchors, with their sterns towards the sea. They were left aground in this position. The captain of the port, Captain Delano, was on board one of the whale ships at the time; whose hatches were battened down and dead-lights shipped. All hands took to the rigging for safety. The first great wave came in an unbroken swell to the stern of the vessel, broke over and lifted her along without doing any material harm more than sweeping her decks. Dragging the slack chain over the mud checked her gradually, as the first impetus of the wave diminished. Whirling her round, the

* Thieves were numerous in Talcahuano. Directly after the ruin these scoundrels set to work,—crying 'Misericordia!' and with one hand beating their breasts, with the other they stole most industriously.

† Or steadied by a light anchor and hawser, which would bear no strain.

‡ Chain. The holding ground is excellent; a soft tenacious mud.

§ About half a cable's length, or from sixty to one hundred yards.

water rushed out to seaward again, leaving the vessel aground nearly in her former position. From two fathoms, when aground, the depth alongside increased to ten when the water rose highest, during the last wave. The two latter waves approached, and affected the shipping similarly to the former. All held on; though some of the anchors started a few fathoms. Some of the vessels were thrown violently against others; and whirled around as if they had been in the vortex of a whirlpool. Previous to the rush of waters, the Paulina and Orion, two merchantmen, were lying a full cable's length apart. Afterwards they were lying side by side, with three round turns in their cables. Each vessel had therefore gone round the other with each wave. The bow of one was stove in. To the other little damage was done. A small vessel* was on the stocks, almost ready for launching; she was carried by the sea two hundred yards in shore, and left there unhurt. A small schooner, at anchor before the town, slipped her cable, and ran out in the offing as the water fell. She met the wave unbroken, and rose over it as an ordinary swell. The Colocolo† was under sail near the eastern entrance of the bay. She likewise met the wave as a large swell, without inconvenience.

Many boats ‡ put off from the shore before the sea retired. Some met the advancing waves before they broke, and rose safely over them; others, half swamped, struggled through the breakers. The fate of one little boy was extraordinary. A servant woman had taken refuge with him in a boat: the boat was dashed against an anchor lying on the shore, and divided. The woman was drowned, but the half of the boat containing the child § was carried out into the bay. It floated, and the child held firmly. He was picked up afterwards, sitting upright, holding steadily with both hands; wet and cold, but unhurt. The boy's name is Hodges. His father is an Englishman, well known at Talcahuano; he was an officer in the British navy.

Four days afterwards the sea was strewed with wreck, not only in the bay of Concepcion, but outside in the offing. The shores of Quiriquina Island were covered with broken furniture and woodwork of all kinds; so much so, that for weeks afterwards parties were constantly at work collecting and bringing back property. During three days succeeding the day of the ruin the sea ebbed and flowed irregularly, and very frequently. For some hours after the shock it rose and fell two or three times in an hour.

Eastward of the island of Quiriquina, the swell was neither so large nor so powerful as that which swept over Talcahuano. Having more room to expend its strength in the wider and deeper part of the bay, may perhaps have been the reason why the sea swelled

* About thirty tons. † Chilian schooner-of-war.
‡ Chiefly, if not all, whale boats. § Only four years old.

rapidly, without breaking, near Lirquen, in the south-east part of the bay, and why it broke over Tomé* with violence, though not so furiously as over Talcahuano. The great waves coming from the sea appear to have been divided, at the entrance of Concepcion Bay, by the island of Quiriquina, and turned aside both ways; one part taking its course along the Tumbez or western shore, towards Talcahuano, the other *across* the eastern opening, towards Tomé.

While the bay of Concepcion was agitated by the great waves, it was noticed by Captain Walford (from his house at Lirquen) that the Colocolo was swept to and fro remarkably. She was under sail near the eastern entrance of the bay. Two explosions, or eruptions, were seen while the waves were coming in: one beyond the island of Quiriquina, in the offing, was seen by Mr. Henry Burdon and his family, who were then embarked in a large boat near Tomé; it appeared to be a dark column of smoke, in shape like a tower. Another rose in the middle of the bay of San Vicente, like the blowing of an immense imaginary whale. Its disappearance was followed by a whirlpool, which lasted some minutes. It was hollow, and tended to a point in the middle, as if the sea was pouring into a cavity of the earth. At the time of the ruin, and until after the great waves, the water in the bay appeared to be every where boiling; bubbles of air, or gas, were rapidly escaping. The water also became black, and exhaled a most disagreeable sulphureous smell. Dead fish were also thrown ashore in quantities; they seemed to have been poisoned, or suffocated. For several days afterwards the shores of the bay were covered with fine corvinos, and numerous small fish. Black stinking water burst up from the ground in several places. In Mr. Evans's yard at Talcahuano the ground swelled like a large bubble, and then bursting poured forth black fetid sulphureous water. Near Concepcion similar outbursts of water were seen and similarly described.

It was said, and generally considered certain, that every dog had left the town before the shock which ruined the buildings was felt. By a marked part of the wall of Captain Delano's house, it was ascertained that the body of water reached twenty-five feet above the usual level of high water. It penetrated into the Altos,† and left sea-weed hanging to the remains of roofs, or to the tops of broken walls. But this must not be taken as the general height of the wave. A body of water, rushing upon a sloping beach with such force, would naturally preserve its impetus for some time, and run up an inclined plane to a great height. Those who

* Tomé is near the eastern entrance of the bay, where the wave would meet with more interruption than near Lirquen, though considerably less than in the *western* passage.

† First-floor rooms.

watched the waves coming in considered them, while beyond the shipping, about as high as the upper part of the hull of a frigate, or from sixteen to twenty feet above the level of the rest of the water in the bay. Only those parts of the wave broke which encountered opposition, until within half a mile of the beach, when the roar became appalling.

Persons, who were standing on the heights overlooking both bays, saw the sea come swelling into San Vicente, at the same time that it advanced upon Talcahuano. The explosion in San Vicente, and the sea advancing from both sides, made them think that the peninsula of Tumbez was about to be separated from the main land, and many ran higher up the hills until they had reached the very highest point.

Strange extremes of injury and harmlessness were among the effects of these overwhelming waves. Buildings were levelled, heavy twenty-four pound guns were moved some yards and upset; yet a child was carried to sea uninjured, and window-frames with the glass in them were thrown ashore upon the island of Quiriquina without a pane being broken!

According to a register kept by Captain Delano, it appeared that his barometer fell four or five tenths of an inch between the 17th and 18th of February, and was still falling on the morning of the 18th, after which it rose again.* So great and sudden a fall, not followed by bad weather, *may* have been connected with the cause of the earthquake; but some doubt hangs over these observations. The barometers on board the Beagle, at that time in Valdivia, did not indicate any change. Still, at so great a distance, it does not follow that the mercury should move similarly.

In a river near Lirquen, a woman was washing clothes at the time of the great shock. The water rose instantaneously from her feet half way up her legs, and then subsided gradually to its usual level. It became very muddy at the same time.

On the sea beach the water swelled up to high-water mark at the time of the shock, without having previously retired. It then began to retire, and continued falling about half an hour, when the great wave was seen approaching.

For some days after the ruin the sea did not rise to the usual marks, by four or five feet vertically. Some thought the land had been elevated, but the common and prevailing idea was, that the sea had retired. This difference gradually diminished, till, in the middle of April, there was a difference of only two feet between the existing and former high-water marks.

The proof that the *land* had been raised exists in the fact, tha

* In Concepcion a fall of two or three tenths indicates bad weather; four or fiv tenths, a gale of wind with much rain.

the island of Santa Maria was upheaved nine feet; but of this presently.

In passing through the narrow passage which separates Quiriquina from Tumbez, the great waves had swept the steep shores to a height of thirty feet (vertically) above high-water mark; but this elevation was attained, in all probability, only at the sides of the passage, where the water met with more obstruction, and therefore washed up higher. The passage appears to be nearly one mile in width, and has ten fathoms water in the middle, but the rocks on the western side diminish its navigable width to half a mile.

Wherever the invading waves found low land the destruction was great, those low lands being in general well cultivated, and the site of many houses. The low grounds lying at the bottom of Concepcion bay, particularly those of the island De los Reyes, were overflowed and injured irreparably. Quantities of cattle, horses, and sheep were lost. Similar effects, in an equal or less degree, were felt on the coasts between the river Itala and Cape Rumena. Large masses of earth and stone, many thousand tons in weight, were detached from the cliffs and precipitous sides of the hills. It was dangerous to go near the edge of a cliff, for numerous chasms and cracks in every direction showed how doubtful was the support. When walking on the shore, even at high water, beds of dead mussels, numerous chitons and limpets, withered seaweed still adhering, though lifeless, to the rocks where they had lived, every where met the eye; the effects of the upheaval of the land.

I. Santa Maria.—Besides suffering from the effects of the earthquake, and three invading waves which, coming from the west round both points of the island, united to overflow the low ground near the village, Santa Maria was upheaved nine feet. It appeared that the southern extreme of the island had been raised eight feet, the middle nine, and the northern end upwards of ten feet.

The Beagle visited this island twice, at the end of March, and in the beginning of April. At her first visit it was concluded, from the visible evidence of dead shell-fish, water-marks, and soundings, and from the verbal testimony of the inhabitants, that the land had been raised about eight feet. However, on returning to Concepcion, doubts were raised; and to settle the matter beyond dispute, or the possibility of mistake, the owner of the island, M. Salvador Palma, accompanied us. An intelligent Hanoverian, whose occupation upon the island was sealing, and who had lived two years there, and knew its shores thoroughly, was also a passenger in the Beagle.

When we landed, the Hanoverian, whose name was Antonio

Vogelberg, showed me a spot from which he used formerly to gather choros* by diving for them at low water.

At dead low water, standing upon that bed of choros, and holding his hands up above his head, he could not reach the surface of the water. His height is six feet; on that spot, when I was there, the choros were barely covered at high spring tide.

Riding round the island afterwards, with Mr. Palma and Vogelborg, many measures were taken in places, where no mistake could be made.

On large steep-sided rocks, where vertical measures could be correctly taken, beds of dead mussels were found ten feet above the present high-water mark.

A few inches only above what was taken as spring tide, high-water mark, were putrid shell-fish and seaweed, which evidently had not been wetted since the upheaval of the land.

One foot lower than the highest bed of mussels, a few limpets and chitons were adhering to the rock, where they had grown.

Two feet lower than the same mussels, chitons and limpets were abundant.

An extensive rocky flat lies around the northern parts of Santa Maria. Before the earthquake, this flat was covered by the sea, some projecting rocks only showing themselves. Now, the whole flat is exposed. Square acres (or many quadras) of this rocky flat were covered with dead shell-fish, and the stench arising from them was abominable.

By this elevation of the land, the southern port of Santa Maria has been almost destroyed. There remains but little shelter: and very bad landing. The soundings have diminished a fathom and a half every where around the island.

Tubul.—At Tubul, to the south-east of Santa Maria, the land has been raised six feet.

The waves did not enter that river's mouth until about one o'clock; and then in greater number, but with less force. Six or seven waves were counted. Might not this be owing to the meeting of the divisions of that great wave which passed around the island of Santa Maria?

I. Mocha.—At the island of Mocha the shock of the earthquake was so strong that people could not stand. The sea washed over the rocks at the end of the island, higher than it had ever reached in a heavy gale of wind.

Antonio Vogelborg was on one of those rocks, or rather on an islet at the south end of Mocha, at the time. A party were with him, sealing. Their boat was hauled up upon the top of the rocky islet. They expected to be washed off, and held by the boat, in readiness. The boat was lying nearly east and west.

* A large kind of mussel.

During the earthquake, some water in her bottom ran quickly from one end of the boat to the other, as if some one were quickly lifting one end off the ground, and letting it down again. It did not wash from side to side at any time. Two forked sticks were stuck in the ground, about three yards apart, another lay across them for hanging things to dry: these sticks also were nearly east and west of one another. During the shock they waved to and fro till the forks touched, and the cross stick fell. Strong shocks were felt by vessels under sail near Mocha. Between Mocha and Concepcion shocks were felt by several vessels, not only on the 20th, but during the following days.

At anchor off Mocha, on the 24th, a slight shock was felt which resembled the sudden dragging of the anchor over rocks.

Under way on the 2d of March, it was thought that the chain cable was running out at the hawse.

In one vessel, they thought she had run ashore; on board of another, that the ship had passed over a whale. Vogelborg thinks the land has been upheaved about two feet. From his accuracy in other matters, I am inclined to trust to his opinion.

Valdivia.—At Valdivia, the shock began gently, increased gradually during two minutes, was at its strongest about one minute, and then diminished.

The motion was undulating and regular, like waves rolling from west to east, but strong; it lasted nearly ten minutes. There was no difficulty in standing or walking, but the houses waved and cracked.

The stone church tottered, but was not injured; its roof is very light. All the dwelling-houses, being strongly built of wood, withstood the shock.

Some thought the motion was from south-west to north-east, but Mr. Darwin, and a person with him at the time, thought the reverse. The river swelled, or rose, at the same time, and quickly fell again to its former height. In the port the sea swelled suddenly upon the shore, to high-water mark, though it was then nearly the time of low-water, and quickly fell again. Both sea and river rose and fell frequently, during the remainder of the day. The river never fell below its usual height, neither did the sea retire beyond its proper place, at that time of tide; but each swelled from time to time, and again sunk down. This happened once or twice in an hour. After the great convulsion, other slighter shocks were felt, at intervals of a few minutes, during an hour.

In the afternoon, at about five, a smart shock was felt, which made the people run out of their houses.* One man and one

* Although built of wood.

woman were drowned by the sudden rise of the sea, near Fort Niebla; it was supposed that they were upon the rocks, gathering shell-fish. Excepting in this instance, no injury was done at Valdivia.

No noise preceded or accompanied any of the shocks at Valdivia.

I. Chiloe.—This great earthquake extended to the island of Chiloe, and probably still farther to the southward. The shock was there slight, but lasted during six or eight minutes; it was neither preceded nor followed by any subterranean noise. About thirty-four minutes after eleven,* the beginning of the shock was felt: the motion was undulating, and not strong. The swell of the sea was felt there, but I know not at what time. A man was going to leave the shore † in his boat; he went a short distance to fetch something, and returning found the boat aground and immoveable. Puzzled and vexed, he went away; but had not gone many yards before his son called to him that the boat was afloat.

Northward of Concepcion, Coliumo.—In the little port of Coliumo, close to the northward of Concepcion Bay, the waves rose about as high as at Tomé, nearly fourteen feet, before they reached the shore. The little village of Dichato shared the general calamity; but standing rather higher, and more distant from the sea than Talcahuano, it escaped the ravages of the sea.

Maule.—The force and height of the waves must have been considerably diminished at the mouth of the Maule. No particular effect had been noticed at the time, nor were there any marks upon the shore by which the height of the wave could be afterwards ascertained.

That the sea should not there have occupied attention is not surprising, when one considers the locality of "La Constitucion," as the town and port are called. On level low land, at the south side of the river, is the town. Between the town and the sea is high land, and a distance of about a mile. The river winds round the northern promontory of the high land, and then fights its way to sea over a bar on which there are always breakers.

Without going half a mile, and up the hill, the sea cannot be seen. There are no houses on the sea-shore. Naturally, then, for some time after the town was ruined by the earthquake, the inhabitants would be engaged in saving and sheltering their property, rather than looking at the sea. I could not ascertain whether the river had risen or not. A vessel lying close under the promontory mentioned above, was obliged to move as quickly as possible when the shocks began, so serious was the shower of

* Mean time. † Sandy Point, San Carlos.

stones which rattled down the hill, and fell about and on board of her. I was assured by the governor, by the chief pilot, and by other residents, that instead of the land having been elevated at all, they considered that it had sunk about two feet. The pilot said that he had found two feet more water on the bar, since the great shock; and that he was certain the banks of the river were lower, though he could not say exactly how much. A rush of water might have shifted the loose sands of the bar. Whether the land had sunk, seemed to me very doubtful.. Certainly, however, it had not risen.

Having previously heard that the waves had been very powerful at the mouth of the Maule, I was a good deal surprised to find they had been almost unnoticed. All attention had been engrossed with the earthquake.

Juan Fernandez.—The island of Juan Fernandez was affected very much. Near Bacalao Head, an eruption burst through the sea in a place about a mile from the land, where the depth is from fifty to eighty fathoms. Smoke and water were thrown out during the greater part of the day: flames were seen at night. Great waves swept the shores of the island, after the sea had retired so much that old anchors were seen at the bottom of the anchorage.

This earthquake was felt at all places between Chiloe and Copiapo; between Juan Fernandez and Mendoza. On the sea-coast within those limits, the retiring and swelling of the ocean was everywhere felt. At Mendoza, the motion was evenly gentle. Copiapo, Huasco, and Coquimbo felt similar, although rather more forcible, undulations. On the continent, towns and houses which lay between the parallels of thirty-five and thirty-eight, suffered extremely; nearly all were ruined. Northward and southward of those parallels, slight injury was done to any building.

In the parallel of thirty-three and a half, Juan Fernandez suffered; yet Valparaiso, opposite, escaped uninjured.

As to the state of neighbouring volcanoes, so various and indistinct were the accounts of their action, after and before the earthquake, that as yet I have had no means of ascertaining the truth.

On Mocha island, formerly well peopled by Indians, there are now no aboriginal inhabitants. A few natives of Concepcion, or Valdivia, live there, for the sake of sealing on the rocks. Mocha is high, with deep water around it; but straggling, dangerous rocks lie near, towards the south-west.

All the west coast of South America, with but few exceptions, is similar in character. High, steep, rocky shores, with deep water near them, are almost everywhere found.

Northern Chile and Peru are well known, but I have not met with an explanation of the fact, that no rain falls in Lower Peru.

Is not the south-east trade-wind deprived of its moisture, and partly checked, by the Andes, before it reaches the low regions at their western base? That wind is perennial.

The Galapagos Islands are all volcanic, of comparatively recent formation. Their lavas seem to be very durable. Vegetation makes small progress. On five islands there are fertile spots; at one of which, Charles Island, a small colony has lately been established by the government of Guayaquil.

There are six principal and seven small islands. The largest is sixty miles in length, and about fifteen broad. The highest part is 4000 feet above the sea. At first landing upon their shores, black, dismal-looking heaps of broken lava everywhere meet the eye. Innumerable crabs, hideous iguanas (or rather large lizards), and great elephant tortoises startle and surprise. These two latter reptiles are peculiar to the Galapagos. The name itself is Spanish for land tortoises. These animals grow to a great size, —to several hundred pounds in weight. Their feet are then like those of a small elephant. Few reptiles are uglier than those black lizards. They are about three feet in length. Their great mouth has a pouch hanging under it. A spiny sort of mane is on the neck and back. They have long claws and tail, and are of a dirty black colour. They swim with ease and swiftness, using their tails only.

A little way inland, on the windward side of the island, there is much underwood and some crooked trees nearly two feet in diameter. How they are able to penetrate, or derive nourishment from, the hard lava, is perplexing.

A shell is common on these shores, which reminds one of the purple murex. The fish emits a strong dyeing liquid of a similar colour.

The little colony is established on Charles Island, in a plain about 1000 feet above the sea. To go there, we ascended gradually from the shore till we reached the edge of the rocky height which limited our view. Surprisingly sudden was then the change. Heated and tired by a dusty up-hill walk, through sun-dried trees and over rugged lava, our bodies were at once refreshed by a cool breeze, while our eyes enjoyed an unexpected view of a fertile and cultivated plain. Surrounded by tropical vegetation, by bananas, sugar-canes, sweet potatoes, and Indian corn, all luxuriantly flourishing, it was hard to believe that land so sterile, and apparently so useless as that we had just passed, could be so close to such rich fertility.

In a small cave near the top of this island an old sailor lived many years. He had been unfortunate, and was tired of the

world. Terrapin (or land-tortoises) and sweet potatoes were his food. An old friend, the master of a whaler, recognized him, and carried him away by force, for so strongly was the old man attached to his cave, that no motive was sufficient inducement for a willing departure.

Besides affording a wholesome and palatable food, the terrapin yield an excellent oil. But it is a pity to kill them for this purpose; they are so useful to the crews of whale ships.

The little colony can now supply shipping with vegetables, fowls, and pigs. Very soon they will have cattle, sheep, and goats. Water for shipping can only be procured at the south side of Chatham Island.

The particular names of these islands were given by the old Buccaneers, and by Colnett.

More instances of the manner in which high land deprives wind of its moisture may be seen at each of the Galapagos. Situated in a perennial wind, only those sides which are exposed to it are covered with verdure and have water. All else is dry and barren.

Passing a projecting headland, we were all struck by the wildness and grandeur of the scene which opened to us, as the ship sailed round. Immense craters, suddenly rising from the sea—enormous masses of black lava—and a multitude of fumeroles, scattered in every direction—gave one the idea of an immense Cyclopian iron foundry. In many places the lava cliffs are very high, while close to them the water is so deep that a ship cannot anchor, even in a calm. From this situation dismal indeed was the view, yet interesting. To see such an extent of country overwhelmed by lava, and to think of the possible effects of seven dormant volcanoes then in sight, was impressive.

Remarkable currents are found about the Galapagos. In some places they run three, four, or even five miles an hour, generally, but not always, to the north-west. On one side of an island the temperature of the sea is sometimes found to be near eighty, while on the other the water is at less than sixty degrees (Fahrenheit). These striking differences may be owing to the cool current, which comes from the southward along the coast of Chile and Peru, meeting a far warmer stream from the neighbourhood of the bay of Panama. The manner in which these great ocean streams preserve their temperature has been remarked: they must have much effect upon the climates of those countries near the sea along whose shores they

The Dangerous Archipelago is deserving of such a name. Numerous coral islets, only a few feet above water, obstruct navigation; while currents and strong squalls add to the risk. Singular interruptions to the trade-wind are caused by these low lagoon islands; not only does the trade often fail among them, but heavy

squalls come from the opposite direction, and more frequently by night than by day. Clouds are said to be attracted, if not partly caused, by land or by trees. As the low islands of this archipelago have no hill or height of any kind about which the clouds attracted by them can gather and discharge their contents, whether electrical or fluid, perhaps those clouds wanting a conductor discharge themselves irregularly and in squalls. Where high land acts as a conductor between the upper regions of the air and the earth, there may be a continual though unperceived electrical action.

Otaheite, or Tahiti, as it is more correctly called, is indeed beautiful. We saw it early in the morning, and were at first disappointed. Clouds hung over the land; but as the sun rose higher the clouds shrunk away, vanishing as they rolled off the grandly formed mountains. High, sharp, irregular peaks, and huge masses of rock appeared between the clouds, and again were hidden. Deep valleys, or glens, showed darkly; and as the shadows passed, seemed to be denied the light of day. Strikingly different in appearance were the lower hills, and the richly wooded land at the sea-side. There the bright sunshine heightened the vivid and ever-varying tints of a rich verdure. Every kind of green, a beautiful alternation of light and shade, each moment changing as the light clouds passed; the groves of graceful palm trees, and the dazzling white foam of the breakers on the coral reefs, contrasted by the deep blue of the sea, combined to form a most enchanting view.

But few days were passed at this delightful island. What little we saw of the missionaries, and what we heard of their labour, and its effects, highly gratified us. But we were yet more gratified by hearing of the number of native missionaries who had gone into other distant islands (having been educated at Tahiti), and of the beneficial effects produced by them. Wherever the missionary succeeds in obtaining even a slight influence, there the seaman may go in safety. He should not be ungrateful. He should not be among the first to seek for faults. What man, what human institution is blameless?

In the Gambier Islands there is now a Roman Catholic mission. It is said to be well supported.

What a fine fertile country is the northern island of New Zealand; and how fast the character of that land and its inhabitants is changing! An Englishman may now walk alone, and unmolested about any part of the northern island, where, ten years ago, such an attempt would have been a rash braving of the club and the oven.

English and American houses are scattered near the Bay of Islands; and settlers are rapidly increasing. All this is chiefly due to the Church Missionary Society.

Nothing could be more gratifying than the view of a flourishing

agricultural settlement, with good farm-houses, barns, water-mill, mechanics' shops, and large gardens, in the interior of the northern island. I was astonished at what I saw; and when a New Zealander came out of the mill, powdered with flour, and carrying a sack of corn upon his back, I could hardly believe my own eyes. This effect has been caused by the missionaries. But I must hasten to a conclusion.

Sydney and Hobart Town are known well; yet I do not think every one is aware of the great difficulty of bringing up a family well in those countries, owing to the demoralizing influence of convict servants, to which children must more or less be exposed. Nor is every one aware of the extent of that rancorous feeling which is caused by the total separation of the descendants of convicts, as well as the emancipists, from free settlers and their families, as well as from all who are officially employed.

At King George's Sound they are not doing much, but are very sanguine.

Swan River, notwithstanding its untoward exposure to the most frequent winds, is flourishing.

An English family has settled upon the Keeling Islands, where they make cocoa-nut oil, and catch abundance of turtle. Every creature upon those islands seemed to live principally upon cocoa-nuts. Pigs, ducks, fowls, and even large crabs are dependent upon them.

The Keelings, or Cocos, are a cluster of low coral islands, almost surrounding a lagoon. Within half a mile of them I found no bottom with more than 1000 fathoms of line, (1600 were out.) We were surprised to see that some of the fish lived upon coral branches, for which kind of grazing they are furnished with strong front teeth.

Before a hurricane at the Mauritius, the water rises considerably, and is agitated. In other parts of the world the sea rises before a storm some feet above its usual level. At the same time mercury in a barometer falls. Is not this rising of the waters caused by diminished pressure of the atmosphere at those places, while at other more distant parts there is an increased pressure?

Returning homeward by St. Helena, Ascension, and the Cape de Verd Islands, I had opportunities of proving that the rollers, which sometimes set heavily upon their shores, are caused by distant gales of wind. Those at Ascension and St. Helena, for instance, by Pamperos, and those at the Cape de Verds, by the severe, though generally short gales met with between the Tropics in the time of the line westerly Monsoon. These latter gales may also send rollers towards the north-west side of Ascension.

The heavy rollers which sometimes set in upon the coasts of

Chile and Peru led me to seek for proofs of the causes being such as I then suspected? But there is at times another kind of "rollers," which are perhaps caused by an earthquake.

Tides, dip, intensity and variation, temperature of air and water, pressure of the atmosphere, and some other matters, have been regularly observed; but time will not allow of my now making an abstract of the results.

It may appear presumption in a plain sailor attempting to offer an idea or two on the difficult subject of "Tides;" yet, with the utmost deference to those who *are* competent to reason upon the subject, I will venture to ask whether the supposition of Atlantic tides being principally caused by a great tide-wave coming from the Southern Ocean, is not a little difficult to reconcile with the facts that there is very little tide upon the coasts of Brazil, Ascension, and Guinea, and that, in the mouth of the great river Plata, there is little or no tide?

Can each ocean have its own tides, though affecting, and being affected by, the neighbouring waters?

Can the *mass* of an ocean have a tendency to move westward as well as upward, after and towards the moon as she passes? If so, after the moon has passed, will not the mass of that ocean have an easterly inclination, to regain that equilibrium (with respect to the earth alone) from which the moon disturbed it? (Sun's action not here considered.)

In regaining its equilibrium, would not its own momentum carry it too far eastward? and would not the moon's action be again approaching?

Can one part of an ocean have a westward tendency, while another part, which is wider or narrower from east to west, has an eastward libration? If so, many difficulties would vanish: among them, those which were first mentioned, and those perplexing anomalies on the south coast of New Holland.

This sketch has been very hastily written, since the Beagle's arrival in England, and is therefore far inferior to the writer's wishes.

Annexed, are a few positions, of which the longitudes are supposed to be relatively right, and some notes, showing upon what the chronometric measurements depend.

Coast.	Name of Place.	Name of Particular Spot.	Latitude.	Longitude in Time.	Variation.
			North.	West. h. m. s.	
England	Devonport	Baths	50° 22′ 00″	0 16 40	25° 18′ W.
	Falmouth	Pendennis Castle	50 08 33	0 20 11	
Western Islands.	Terceira	Mount Brazil	38 38 35	1 48 52	24 18
	St. Michael's	St. Braz Castle	37 43 58	1 42 41	
C. Verd Isl.	Quail Island	Gun Point	14 54 02	1 34 00	16 30
			South.		
Brazil.	Pernambuco	Fort Picao	8 03 35	2 19 26	5 54
,,	Bahia	Fort San Pedro	12 59 20	2 34 03	4 18
Abrolhos.	St. Barbara Island	East Summit	17 57 42	2 34. 46	2 00 W.
Brazil.	Rio Janeiro	Villegagnon Island	22 54 50	2 52 35	2 00 E.
Riv. Plate.	Monte Video	Rat Island	34 53 20	3 44 53	12 00
East Coast of Patagonia.	Blanco Bay	Wells	38 57 00	4 07 54	15 00
	River Negro	Pilot's House at the entrance	41 00 42	4 11 05	17 42
	,,	Town	40 48 18	4 11 52	
	River Chupat	South-entrance Point.	43 20 25	4 19 34	18 06
	Port Desire	Ruins	47 44 56	4 23 40	20 12
	Port St. Julian	Lieut. Sholl's Monument	49 15 20	4 30 48	21 00
Tierra del Fuego.	River Santa Cruz	Keel Point	50 06 45	4 33 34	20 54
	Good Success Bay	Watering Place	54 48 00	4 16 56	22 54
	Cape Horn	South Summit	55 58 41	4 29 04	24 00
	Port Famine	Observatory on West Side	53 38 15	4 43 51	23 00
Falk. Isl.	Berkeley Sound	Port Louis Settlement	51 32 15	3 52 29	19 00
Chile.	Midship Bay	East Side of Centre Island	45 18 30	4 58 25	20 48
	Port Lowe	Observation Inlet	43 48 30	4 56 09	19 48
	Huafo Island	Peak on N.W. end	43 35 30	4 59 10	
	S. E. extreme of Chiloe	Port San Pedro	43 19 30	4 54 59	
	Port San Carlos	Sandy Point	41 51 20	4 55 44	18 0
	Valdivia	Observation Spot near Fort Corral	39 52 53	4 53 56	
	,,	Town	39 49 20	4 53 15	
	Mocha Island	E. Side near N. Point	38 19 35	4 55 59	
	St. Mary's Island	Observation Spot near rivulet	37 02 48	4 54 12	
Concepcion	Talcahuano	Fort Galvez	36 42 00	4 52 40	16 48
Chile.	River Maule	Church Rock	35 19 40	4 49 55	16 24
	Valparaiso	Fort San Antonio	33 01 53	4 46 45	15 18
	Papudo	Landing Place	32 30 09	4 46 03	15 12
	Pichidanque	S E. Point of Island	32 07 55	4 46 20	15 24
	Coquimbo	S.W. Corner of Herradura Bay	29 58 41	4 45 43	14 24
	,, Town	Mr. Edward's House	29 54 10	4 45 15	
	Tortoralillo	South-entrance Point	29 29 15	4 45 35	
	Huasco	Capt. of Port's House	28 27 15	4 45 16	13 37
	Herradura de Carrisal	Landing Place	28 05 45	4 45 03	13 23
	Pajonal	S.E. Corner	27 43 30	4 44 28	13 28
	Copiapo	Landing Place	27 20 00	4 44 08	13 32
	English Harbour	Sandy beach in S.W. Corner	27 05 20	4 43 44	13 30
	Flamenco	S.E. Corner of Bay	26 34 30	4 43 16	13 46
	Lavata	Cove near S.W. Point	25 39 30	4 43 09	

Coast.	Name of Place.	Name of Particular Spot.	Latitude.	Longitude in Time.	Variation.
			South.	West.	East.
			° ′ ″	h. m. s.	° ′
Peru.	Copiapo . . .	Landing Place . .	27 20 00	4 44 05	13 36
	Iquique . . .	Centre of Island . .	20 12 30	4 40 58	12 18
	Callao . . .	Flag Staff in Arsenal	12 04 00	5 08 54	10 36
Galapagos Islands,	Chatham Island .	S.W. Point of Stephen's Bay. . .	0 50 00	5 58 27	9 30
	Charles's Island .	Post-office Bay, S. E. corner	0 15 25	6 02 06	
	Albemarle Island, near S. W. end	Iguana Cove . . .	0 59 00	6 06 09	
	Albemarle Island	Tagus Cove . . .	0 15 55	6 05 47	9 30
	Otaheite . . .	Point Venus . . .	17 29 15	9 58 18	7 54

Carrying the Chronometric Chain one Place farther Westward, gives for the position of

New Zealand.	Bay of Islands .	Paihia Islet . . .	35 16 30	11 37 12

Measuring Eastward from Bahia gives the following results:—

Coast.	Name of Place.	Name of Particular Spot.	Latitude.	Longitude in Time.	Variation.
			South.	West.	
Brazil.	Bahia . . .	Fort San Pedro . .	12 59 20	2 34 03	4 18 E.
	Ascension . .	Barrack Square . .	7 55 33	0 57 37	13 30 W.
	St. Helena . .	Close to high-water mark in the merid. of the Observatory	15 55 15	0 22 51	18 00
				East.	
Cape	Simon's Bay .	East end of Dock Yard	34 11 24	1 13 43	28 30
	Cape Town . .	Observatory . . .		1 13 54	
Mauritius	Port Louis . .	Observatory . . .	20 09 25	3 50 06	11 18
Keeling Is.	Direction Island	South Point	12 05 22	6 27 39	1 12
Australia.	King George's Sd.	Princess Royal Harbour, Government new buildings .	35 02 11	7 51 46	5 36
	Hobart Town .	Fort Mulgrave . .	42 53 30	9 49 37	11 06
	Sydney . . .	Fort Macquarie . .	33 51 30	10 05 08	10 24
	Paramatta . .	Observatory . . .		10 04 16	
N. Zeald.	Bay of Islands .	Paihia Islet . . .	35 16 30	11 36 39	14 00
Pacific.	Otaheite. . .	Point Venus . . .	17 29 15	9 57 45	7 54

By the Beagle's chronometers the meridian distances between Falmouth and Greenwich are nearly as follows:—

	h. m. s.
Portsmouth Observatory, from Greenwich	0 04 24,5
Devonport (Government House) from Portsmouth	0 12 15,3
Pendennis Castle, Falmouth, from Devonport	0 03 31,1
Falmouth, west of Greenwich	0 20 10,9

Results of a few of the Observations made by the Officers of the Beagle's Tender, 1834 and 1836.

1834.	Name of Place.	Name of particular Spot.	Latitude.	Long. W. of Green.	Variation.
Coast.			South. ° ' "	h. m. s.	East. ° '
Falkland Islands.	Ship Harbour	S.W. end of Ship Isl.	51 43 10	4 05 09	20 3
	Port Louis	Settlement Creek	51 32 15	3 52 29	19 0
	Choiseul Bay	S. side of Mare Harb.	51 54 15	3 54 01	19 2
	Long Isl. Sound	W. part of Long Isl.	52 12 15	3 56 19	
	Port Porpoise	Head of Creek	52 20 45	3 57 23	19 7
	Speedwell Island	Harbour on E. side	52 13 00	3 58 46	
	Port Edgar	W. arm on N. side	52 03 15	4 01 06	20 0
	Port Stephens	E. end of harbour	52 11 35	4 02 44	20 4
	Ship Harbour	S.W. end of Ship Isl.	51 43 10	4 05 09	20 3
	Hope Harbour	Fish cove	51 20 45	4 02 42	
	Port Egmont	Ruins of Settlement	51 21 30	4 00 17	19 5
	White Rock Harb.	W. extreme of cliff	51 26 00	3 57 08	
	Port St. Salvador	First inlet on W. side	51 27 00	3 53 21	

1836.	Name of Place.	Name of particular Spot.	Latitude.	Longitude E. or W. of Valparaiso.	Variation.
Coast.			South. ° ' "	East. h. m. s.	East. ° '
Peru.	Paposa	Whitehead			
	Constitucion Hbr.	Shingle Pt. on Island	23 29 10	0 04 04	12 8
	Cobija	Flagstaff	22 31 00		
	Iquique	Centre of Island	20 12 30	0 05 49	12 0
	Arica	Mole	18 28 05	0 05 11	11 0
				West.	
	Islay	Custom-house	17 00 00	0 01 55	11 0
	Atico	East Cove	16 13 30	0 08 15	11 2
	Lomas	Flagstaff on Pt.	15 33 15	0 12 53	10 3
	San Juan	Needle Hummock	15 21 00	0 14 07	10 3
	Bay of Yndependencia	S. Pt. of Santa Rosa Island	14 18 15	0 18 08	
	Pisco	W. Pt. of Paracas bay	13 48 00	0 18 43	10 0
	Callao	Arsenal Flagstaff	12 04 00	0 22 08	10 0
	Supé	W. end of village	10 49 15	0 24 22	9 8
	Guarmey	W. end of sandy beach	10 06 15	0 26 06	9 5
	Samanco	Cross Point	9 15 30	0 27 25	9 5
	Malabrigo	Bay rocks	7 42 40	0 31 97	
	Lobos de Afuera Island	Fisherman's cove on the east side	6 56 45	0 36 10	9 5
	Payta	New end of town	5 05 30	0 37 47	9 0
	Island of Puna	Consul's house on Pt. Española	2 47 30	0 33 05	
	Guayaquil	South end of city	2 13 00	0 32 48	

Remarks on the Beagle's Chronometric Measurements.

Before attaching any value to the results shown in the accompanying paper, many questions will probably be asked. Some of those questions I will endeavour to anticipate by the following short detail.

The chronometers, twenty-two in number,* were taken on board a month before the Beagle finally sailed from Plymouth. Their boxes were placed in sawdust, divided and retained by partitions secured upon two wide shelves. All were in one small cabin, into which no person could enter, except to compare or wind the watches, and in which nothing else was kept. The greater number have never been moved from their places since they were first put into them.

The chronometers have been wound daily at nine, and compared at noon. Both comparing and winding have been performed most accurately and regularly by one person only, Mr. G. J. Stebbing, of Portsmouth.

Time has invariably been obtained by series of equal or corresponding altitudes of the sun; observed by one person, with the same sextant; and the same artificial horizon, with its roof placed in the same manner, both before and after noon.

A very good pocket chronometer, carried by hand in a small box, has been always used for taking time. In every instance it has been compared with the standards immediately before the observations, and immediately afterwards. This watch (Parkinson and Frodsham, No. 1041) was so well constructed, that the intervals shown by it between morning and afternoon observations always agreed with those shown by the standard chronometers (allowing for the respective rates).

Generally speaking, seven altitudes of one limb have been taken, and then the same seven altitudes of the other limb, for one set. Three sets have been usually taken at short intervals, and the mean result used, unless a marked difference occurred, in which case the result of each pair of sights was computed, and the erroneous ones rejected. Those few were considered wrong which differed from the majority. Generally, however, there has been a close agreement between the results of single pairs of sights, as well as of entire sets.

When clouds intervened, the series was unavoidably irregular; but the pairs of equal altitudes were always numerous.

In a very few instances the chronometers have been rated by the

* Twenty-two chronometers were embarked on board the Beagle when she sailed from England. Some failed during the voyage; but none of the measurements depend upon the results of fewer than twelve.

results of absolute or independent altitudes, taken with every precaution at similar times of day. Those rates were obtained by comparing together the times obtained by morning observations, or those deduced from afternoon sights; not by morning and afternoon, or afternoon and morning observations, on different days. But the time, considered *correct*, has invariably been deduced from equal altitudes. At Paramatta and at the Cape of Good Hope, it was ascertained that our time, thus obtained, did not differ from that of the astronomer.

The sextant, used for obtaining time, is a particularly good instrument, made by Worthington and Allan. Its index error has never varied, nor has it ever been out of adjustment. It has been used almost solely for this purpose. Between corresponding altitudes it was more than usually guarded, and on no account handled, or exposed to an unusual change of temperature.

During the first three years of the voyage all observations for time were made by me. During the last two years Mr. J. L. Stokes, assistant surveyor, has made nearly the whole. Latterly my own have been only a few for the sake of comparison. I found that Mr. Stokes was a better, and more attentive observer than myself, and willingly gave way to him, especially as the first and last days at a place,—when good series of observations were so desirable,—have been usually those on which my mind was the most occupied with a variety of details, insignificant perhaps, except in their consequence, and in their being inevitable. Here let me quietly protest against the attempted union of petty astronomer, experiment maker, and captain of a man-of-war in one individual.

Latitudes have been obtained by a variety of methods, and by several officers. The near agreement of their results, when many observations have been made in the same place, induces me to place confidence in those made only by the two best of various instruments.

The computations were made by me, and by some one or two of the officers (for the sake of comparison and proof) during the first three years: since then they have been made by Mr. Stokes and Lieut. B. Sulivan, but inspected, compared, and often proved by myself. Each of those officers is a better computer than I am.

In the list of resulting meridian distances, I have noticed a few remarkable agreements with the determinations of other persons. The accordance of different measurements made by the Beagle, between any two places, is very satisfactory. Yet there hangs a cloud over the synoptic view which I am as yet unable to dissipate, and for which I cannot account in any satisfactory manner. Instead of the length of the whole chain of distances equalling twenty-four hours exactly, it is equal to twenty-four hours and thirty-three seconds. The positions of the Cape of Good

Hope and Cape Horn appear to be ascertained to less than three seconds of time. Those of Valparaiso and Callao agree with the results of the best observations, calculated by Professor Oltmanns. That of Otaheite (or Tahiti) accords with the position assigned by Captain Cook and Mr. Wales. Our longitude of New Zealand agrees exactly with that of M. Duperrey, of the Coquille.

From Sydney to King George's Sound the Beagle corroborates the determination of Flinders; and from the Mauritius to the Cape of Good Hope, the astronomical difference of longitude, and Captain Owen's meridian distance, are in exact accordance with our measurements. How, and where, has an error of thirty-three seconds been caused? The computations have all been examined and verified, again and again. The usual rates of the chronometers, and their daily comparisons, would detect any sudden error or change.

Remarks on Chronometers.

During eight years' observation of the movements of a large number of chronometers, I have become gradually convinced that the ordinary motions of a ship, such as pitching and rolling moderately, do not affect tolerably good chronometers which are fixed in one place, and are defended from vibration and concussion.

Frequently employing chronometers in boats and in very small vessels has strengthened my conviction that temperature is the chief, if not the only, cause (*generally* speaking) of marked changes of rate.

The balances of but few watches are so well compensated as to be proof against a *long* continuance of higher or lower temperature.

It often happens that the air in port, or near the land, is at a temperature very different from that over the open sea in the vicinity. Hence the difference sometimes found between harbour and sea rates.

The change so frequently noticed to take place in the rates of chronometers moved from the shore to the ship, and the reverse, are well known to be partly caused by change of temperature and partly by change of situation.

I have never found chronometers go better than when the boxes were bedded in sawdust, and the watches moving freely in well-oiled jimbals.

Suspending them in cots not only alters their rate, but makes them go less regularly.

When fixed to a solid substance, they feel the vibrations caused by people running on the decks, by shocks, or by chain-cables running out.

A cushion, wool, hair, or any such substance, is preferable to a solid bed; but I can think of nothing better than plain dry saw-dust.

Many chronometric measurements have caused errors, and great consequent perplexity, in the following manner:—

The chronometers were rated in air whose average temperature was (let us suppose) 70°.

They were then carried through air either considerably hotter or considerably colder, and again rated in a temperature nearly equal to that specified.

The rates did not differ much, and it was supposed that the chronometers had been going extremely well: in truth, the rates of most of the watches *had* differed *extremely* from those found in port during the voyage; but they had *returned* nearly to the *old* rates upon reaching nearly equal temperature.

This has happened more or less to every ship carrying chronometers across the equator, especially when going to Rio de Janeiro with the sun to the northward of the line.

Magnetism is supposed by some persons to affect the rates of chronometers. It is difficult to detect.

XVIII.—*Notice of a Visit to the Himmáleh Mountains and the Valley of Kashmír, in* 1835. Communicated by Baron Charles Hügel.

[Baron Hügel, of Vienna, well known as an eminent naturalist, having just returned to this country, after an absence from Europe of six years, chiefly spent in India, has communicated the following account of a journey from the river Sutlej at Belaspúr, through the lower range of the Himmáleh to Kashmír, from thence to the highest part of the Tibet Panjáhl, then to the Attock and back through the Panjáb to Lud'yana, recrossing the Sutlej; accompanied by a letter, tracing his route during his five years' travels, from which a slight extract is subjoined.]

"I left Toulon in May, 1831, visited parts of Greece, Cyprus, Latakia, Syria, and Baalbek; Alexandria, Cairo, and Egpyt, to the confines of Nubia; descended the Nile to Ghineh; crossed to Cosseir, and embarked in the steamer for Bombay, where I arrived in the spring of 1832. In India I visited Puna, Aurungabad, Ellora, Sattara, Bijapúr, Belgám, Goa, Darwar, Bellari, Bangalore, Seringapatam, the Nilgheries, Kochin, Cape Komorin, Palamcotta, and by Ramiseram to Manár in Ceylon. In this Island I visited both the east and west coasts; the highest point Pedradallegalla, near Nur Ellia, and

the little-known interior and the stupendous monuments of the religion of Baudha. Returning to the coast of Coromandel, I reached Madras in September, 1833, where I embarked in his Britannic Majesty's ship Alligator, Captain Lambert, and visited the Easter Islands, the Friendly and Society Islands, Singhapúr, Sumatra, and Java; Swan River, King George's Sound, and Sydney, in Australia; Van Diemen's Land, New Zealand, and Norfolk Island, Manila, and reached Canton in the beginning of 1835. Thence to Madras and Calcutta; by steam to Benares, Lucknau, Allahabad, Agra, Bhurtpúr, Delhi; thence to Massuri and Simlah; and after a stay of three months in the British Himmáleh, I crossed the Sutlej at Bilaspúr, to Kashmír, Attock; recrossed the Sutlej at Lud'yana, returned to Delhi; thence to Ajmêer, Chittoor, Udipoor, Mount Aboo, Almedabad, Surat, and reached Bombay in May, 1836."

The highest chain of the Himmáleh, after the river Sutlej has crossed it, changes its direction more to the north, and detaching from its main body several isolated masses, follows this direction to 75° 30′ E. longitude, where in latitude 35° N. it takes at once a westerly direction. Soon after the Sutlej is passed, the traveller has no more before his eye, from elevated spots, the endless lines of ridges with their white peaks, which is the peculiar character of the highest chain of the Himmáleh, seen from Massúri and Simlah; but only detached mountains, covered with snow, partly intersected with lower ranges and deep ravines, some at a great distance one from another, with valleys between them.

Those detached mountains appear from the plains of the Panjab as one uninterrupted chain. The largest of them, the Mori Range, which begins to the north of Belaspúr; its highest point appears to be the *Mony Müs Kidar:* this bears N.E. from Nadaun, where it is called Tchampr. Seen from Kablí, Mondobri Katiba (Mondobri mountain) appears to be the highest. The Mori Range is divided into three groups of mountains, the highest points of which are called Mondobri Katiba, Gaurazig, and *Mony Müs Kidar;* these bear from Kabli, N. 30° E., N. 70° E., and N. 80° E.; the first is the nearest. The Mori range is entirely unconnected with the highest chain of the Himmálch, and about thirty-five miles in length, from S.E. to N.W.; it terminates abruptly due E. from Núrpúr. It is composed of several more or less rounded peaks to the S.E., and forms at last a long straight line of the same height covered with snow in its ravines. Below them, towards the S.W., is a plain or large valley called Zamber Kidar, overgrown with jungle and without cultivation.

The next are the Santch Mountains, much higher than the Mori

Range; their direction is N.N.W.; they are composed of very extraordinarily shaped points, and extend for about twenty miles. The highest point is Sericot, a singularly shaped pyramid; the range bears from Núrpúr, N.E. to N. by E.

To the west of the Santch Mountains is Baldewa, or Rumnuggur, an insulated snowy mountain; its top forms a plain with a regularly shaped elevation on it. It is the nearest of all to the plains of the Panjáb; this makes it peculiarly conspicuous from thence; in fact, it appears as one of the highest points in the immense panorama from Vizierabad, but disappears entirely when seen in the mountains. Between the Santch Mountains and Baldewa is the shortest road to Kashmír, but impassable for horses. Baldewa's highest point bears N.N.W. from Núrpúr.

Tricota, or Tricota Devi is the last of the insulated snowy points; it is a beautifully-formed mountain when seen from the W., consisting of three peaks, the highest of which is in the centre: it is separated from the plains only by one low range. Tricota is the lowest of those insulated snowy mountains, and the snow, though seldom, disappears sometimes entirely from it.

From the appearance of these mountains the direction of the strata is difficult to be guessed, except from the Mori mountains, where it is from the S.W. to N.E.

From Tricota there is again a great break in the snowy mountains, but not visible from the Panjab. There the Tibetian mountains fill up to the eye the open space; a beautiful valley, the Räs Doon, is at its foot, through which the shortest road leads from Jommú to Kashmír. To the N. by W. of the Tricota Devi rises the Ratan Panjahl, which, although under the snow line, rises 11,600 feet above the level of the ocean. This range is again separated from the Pir Panjahl, which forms an enormous mass of snowy mountains running from 73° to 75° E. long., in the most singular sinuosities. Here the snowy mountains recede more and more from the plains of the Panjab. By a deep and narrow chasm the Jhylum finds its way through them; on the right banks of which the Baramulla mountains continue the same range, which, through the Kamsír mountains, reaches to the river of Attock, and is united with the Tibet Panjahl and the Hindú Kúsh, by immense ranges, named the Gosseie, through which the Attock flows; and Nunnenwarre, through which the Kishen Ganga flows. These mountains have here an entirely different direction than that of the Himmáleh; both run for a certain time from E. by N. rounding to S. by W.; so that the Pir Panjahl, the Baramulla mountains, the Gosseie, Nunnenwarre, and the Tibet Panjahl, form a regular oval of snowy mountains round the valley of Kashmír, which only in its S.W. end, and for one-fifth of its extent, is interrupted by

lower ranges. All the highest mountains which I had occasion to examine round the valley, have their dip to the east of north, rising abruptly with deep precipices from the south and west, with scarcely any vegetation, and have on their top, plains and long ridges, descending at an obtuse angle, and covered with the richest soil and vegetation in the direction of north and east. This changes a little on the Tibet Panjahl, where sometimes plains are on the Kashmír side of the highest range. In this direction Nanga Purvut, or Diamal, (the former the Tibet, the latter the Kashmír name,) bearing N. by W. from the town of Kashmír is the highest point, which, from the Banderpur Pass to Iscardu, appears like a gigantic pyramid rising above all the other mountains.

From Nunnenwarre (N. by W. from the town) the snowy peaks of the Tibet Panjahl have, first, a southerly direction, reaching at the precipitous termination of the mountains to the south and west, within six miles from the actual plains of Kashmír; and then, turning in an easterly direction, recede farther and farther from the valley. In this direction are the two highest points of the whole Tibet Panjahl; which is the continuation of the highest chain of the Himmáleh, and which points I believe to be the highest from the Sutlej to the Indus. They are called Mer and Ser, and consist of two pyramids, one black, the other white, in appearance near one to the other, and of the same height; rising in unparalleled majesty over the boundless region of snow, when seen from the highest point of the Pir Panjahl. These two mountains are seen from Vizierabad, bearing N. 55 E. and N. 57 E., having the plains of the Panjáb, the Pir Panjahl, and the valley of Kashmír between them and Vizierabad; from the valley I think them forty miles distant.

Before the Moguls conquered Kashmír, seven passes existed leading to the valley. Acber entrusted them to hereditary Malliks, allotting them villages, for which they were obliged to defend the pass entrusted to them, and in case of war to appear in the field with a certain number of soldiers, varying from 100 to 500, which at this moment they are unable to do. Acber gave them power of life and death; the Patans reduced this to the power of cutting off noses and ears, and now their power consists in fines. The following is a list of them, beginning to the north of the town, and turning to the east:—

1. Dellawer Mallik. Banderpur Panjahl* (pass), by Kuihama to Iscardú; the highest point of the pass thirty-four miles from the town.
2. Rossul Mallik. Kandriball Panjahl, to Iscardú.

* Pansahl in the Kashmír language.

3. Maredwaderan Mallik. The same Panjahl to Ladak. This pass divides when on the highest point of it, fifty miles from the town.
4. Naubuck Nai Mallik. Naubuk Panjahl, or Tibet Panjahl, by Islamabad and Naubuk to Ladak; the highest point of the pass seventy-four miles from the town.
5. Shahabadka Mallik. Sagam Panjahl nūr Banhall Panjahl. Both to Kishtewar and Jummú; the former fifty, the latter forty-six miles, to the highest point.
6. Kulnarwah Mallik. Kulnarwah Panjahl to Jummú, fifty-four miles to the highest point.
7. Shupianka Mallik. Pir Panjahl, sixty miles to the highest point.

The following are the now existing passes:—

1. Banderpur Pass.
2. Kandriball Pass.
3. Naubuck Pass.
4. Sagam Pass.
5. Banhall Pass.
6. Kulnarwah Pass.
7. Schupianka Pass, mentioned before.
8. Ningmaruk Tera Pass to Prunch; twenty-six miles to the highest point of the pass.
9. Tossemaidan Pass to Prunch, over the plain of Tasse, twenty-six miles to the highest point.
10. Ferospur Pass to Prunch, twenty-eight miles to the highest point.
11. Baramulla Pass, by Canhorn, to Prunch, fifty-two miles to the highest point.
12. Baramulla Pass, by Mozufferabad, the Tchikri of old, to Attock.

All the passes to Prunch are of a very recent date, and for this reason no Mallik exist. It is the same with Baramulla, the now-existing pass being made by the Patans eighty years ago; which appears to throw some doubt on Acber's entering the valley from that direction. He found, at all events, the difficulties so great, that he thought it unnecessary to appoint a Mallik.*

All the passes of Kashmír go over the highest mountains, with the exception of the Baramulla, or Western Pass, which follows the course of the Jhylum. It is rather extraordinary that this river comes from a part of the valley where no snowy ranges exist, and runs in the direction where they rise without termination

* Nos. 11. 12. 5. 3, are the passes always open.

one over the other It is a peculiar feature of the three largest rivers of the Panjáb, the Sutlej, the Jhylum, and the Attock, that they run for a considerable time in the direction of the formation of the highest ridge: the first and the last having their sources beyond the highest mountains of it.

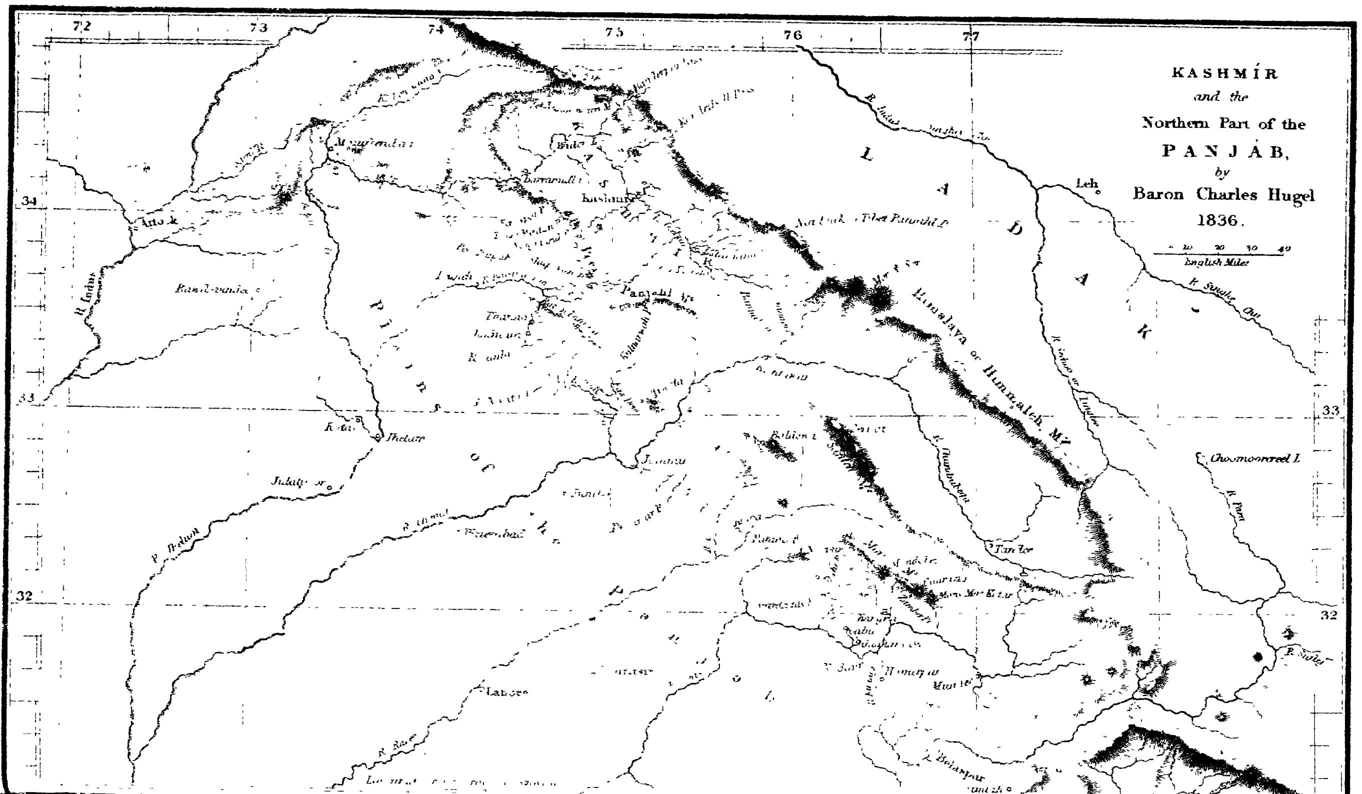
The valley of Kashmír has on its south side gently rising hills, the last declivities of the Pír Panjahl, covered with the most luxuriant vegetation; and the eye gradually ascends over their beautiful forms and colours to the snowy range with its thousand peaks. On this side more or less extensive valleys are formed, in the centre of which the purest mountain-streams flow, and form, higher up, innumerable cascades. In this direction the zoologist and botanist must bend his steps; here the thickest woods are interspersed with open plains, and the wanderer through them finds neither in the former a tree felled by man, nor in the latter the countless flowers bent by the steps of a living being. Here is perfect solitude; there, treasures of vegetation are heaped up without an eye to enjoy them; and the silence is only interrupted by the notes of the blackbird or the bulbul.

The traveller is surprised to find the mountains in this temperate climate very cold; with their southern exposure bare and uncovered; and to reach the highest point, and to see, facing north, plains covered with flowers under the snow-line, and then the richest forests descending to the valley.

Kashmír, in a political and financial point of view, has been much overrated: not in a picturesque one. The valley, in its length from north-west by west to south-east by east is little more than eighty miles long; the breadth, crossing the former line, varying from thirty miles to six. I speak of the actual plains: from the eternal snow of the Pír Panjahl to the Tibet Panjahl are from fifty to sixty miles. Both ranges run nearly parallel in the first direction, with a great number of peaks. The height of the passes from Bimber to Kashmír, and that from Kashmír to Iscardú is the same, nearly from 12,000 to 13,000 feet: the highest point of the Pír Panjahl, 15,000 feet by boiling water. The city of Kashmír, 5800 or 5900 feet* above the level of the sea.

Population.—Four years ago, about 800,000; now, not exceeding 200,000 persons. The valley is divided into thirty-six perganahs, containing ten towns and 2200 villages. Kashmír Town contains still 40,000 inhabitants; Chupeyan, 3000; Islámabád and Pámpur, 2000. It was not the bad administration of the Sikhs, but a famine brought on by frost at the time the rice was in flower, and cholera in consequence of it, that reduced the population to one-

* Three thermometers brought it very nearly to the same height.


KASHMÍR
and the
Northern Part of the
PANJÁB,
by
Baron Charles Hugel
1836.
English Miles
L A D A K
Leh
Himalaya or Himalaleh M.ts
Chumbubetu
Choomoorreel L
R. Para
R. Sutlej
R. Indus
Attok
Rawil-pindie
Plains of the Panjáb
Jhelum
Jelalpur
Lahore
Jummu
Kashmir
Wular L.
Panjahl Mts
Mozafferabad
Belaspur

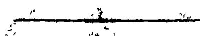
fourth of the former number by death and emigration: many villages are entirely deserted. Chirar Town contains now 2000 houses, and only 150 inhabitants!

Revenue.—Last year very nearly nothing, Ranjít Singh wishing that the country should recover: this year (1836) he asks twenty-three lakhs from the Governor Mohan Singh, which the country cannot give. The emigration has brought to the Panjáb and Hindustán many shawl manufacturers; and Kashmír will, most likely, never yield again what it did a few years ago. Núrpur, Lud'yána, and many other places can bring to the market shawls cheaper than Kashmír, where every article of food is dearer than in the Panjáb and Hindustán.

Wúler Lake is nearly thirty miles from east to west.

Brahmans, the only Hindús in Kashmír, 25,000 in 2000 families; they are Vishnuvaites and Sivaites, divided into three divisions, who all intermarry. They are darker than the other inhabitants, owing to a colony sent for from the Dekhan about 800 years ago, after the aboriginal Brahman race was nearly extinguished by the persecution of the Muhammedans.

There is not in the valley the slightest appearance of its having been drained: the pass through which the Jhylum found its way is one of the most beautiful in the world; its bed, from 1000 to 1500 feet deep. I do not believe more in the traditions of the Kashmírian Brahmans than in the Tables of Manethon.



ANALYSES, &c.

I.—*Narrative of a Residence in Koordistan, and on the Site of Ancient Nineveh; with Journal of a Voyage down the Tigris to Bagdad; and an Account of a Visit to Shirauz and Persepolis.* By the late Claudius James Rich, Esq., the Hon. East India Company's Resident at Bagdad. 2 vols. 8vo. pp. 808. London, 1836.

Of the numerous MSS. left by the highly-gifted and intelligent individual whose too early death every friend of Oriental literature and geographical research must deplore, none seems to claim a higher interest than the subject of the work before us, as it describes a country almost unknown to Europeans, and one which, were we well acquainted with it, would throw great light on ancient as well as modern geography. Who can read of Nineveh, of Arbela, and of Koordistan the country of the Carduchii, without recalling the Assyrian monarch—the haughty conqueror of Darius—the retreat of Xenophon and his brave ten thousand—and the striking events of which these spots were once the scene of action?

But our task is with the more modern territory of Koordistan, and seldom has it fallen to our lot to peruse a more accurate and graphic description of a little-known country—related with all the simplicity of a diary, and devoid of any high colouring or picturesque descriptions, which too often are used but to varnish over the absence of real information.

Mr. Rich was for twelve years British Resident at Bagdad, where he occupied the leisure hours he enjoyed from his public duties in making a collection for a history, and for a geographical and statistical account of the Pashalik.

"In 1820, the state of his health requiring change of air, he made a tour into Koordistan. He afterwards went to Shirauz, whence he visited the ruins of Persepolis, the tomb of Cyrus, and the other remains of antiquity in that neighbourhood. While at Shirauz, the cholera morbus appeared in the city, to which disease Mr. Rich fell a victim on the 5th of October, 1821.

"Of the pages of which we propose to give an analysis, it is not necessary to say much: they speak for themselves. They contain the journal of an eminent man in a new country, for so it may be called, in spite of the scattered notices to be found in the journals of travellers who passed casually and hastily through different parts of it.

They place the geography of Koordistan, and the manners of the inhabitants, in a new and strong light. The geographical fixed points now ascertained, will assist in rectifying the position not only of the different parts of Koordistan itself, but of the adjoining provinces in that portion of Asia."

April 16, 1820, Mr. Rich and his party left Bagdad; travelling in a north direction as far as Tchubook, on the river Diala, and continued along its banks as far as the pass of the Hamreen hills, named Sakal Toutan; thence to Kifri, situated just at the pass into Koordistan; here were found extensive ruins, probably Sassanian, both to the south-east and south-west of the town.

"The easternmost branch of the Kifri hills (which is, in fact, the main trunk or artery), passes by Kerkook, and Altoon Kiupri, thence runs off below Arbil to the Tigris, and is there called the Karatchukdagh. This eastern branch contains gypsum and naphtha. The Western, or Matara hills, are pure sandstone and gravel, and resemble in every respect the Hamreen chain most completely. They offer many circumstances worthy of note. On entering them in the pass of Jumeila, we rode through a ridge or two of perfectly vertical strata, looking as if they had been forced up into their present position.

"By means of a good observation I had at night, I have now been able to satisfy myself as to the true position of Kerkook, which, from my former journals, and those of Sir R. Ker Porter, I had long been persuaded was placed too far westward by our maps. I find I was right in the position I had assigned it. Lat. 35° 27′ N., Long. 44° 27′ E.

"Behind Derbent rises the mountain of Peer Omar Goodroon, forming part of a higher range, to all appearance bare and rocky. Goodroon is the highest mountain in these parts, and is said to contain a glacier, which supplies all Koordistan with snow, or rather ice, the store of which is inexhaustible, and never melts. We perceived snow in some of the clefts.

"I will now endeavour to give some general idea of this part of the Koordish ranges of mountains, as they appeared from the mount of Tchemtchemal.

"The line which we see immediately before us, extending from N. to S.E., is a narrow precipitous bare ridge, which is called the Bazian mountains. To the north of the pass of Derbent i Bazian, which, as I have already remarked, is just before us, the mountains soon make a turn towards the west, where they form the mountains called Khalkhalan, which bound the Pashalik of Keuy Sanjak on the south. To the south of the pass of Derbent, the ridge is continued in a straight line south and a little east. Here is another pass called Derbent i Basterra; beyond which the ridge, continuing in the same line, assumes the name of Karadagh, and becomes well wooded. Here is the third road into Koordistan from the plains of Assyria. It is called the Seghirmeh, or ladder, and passing directly over the crest of the mountain, has been esteemed difficult, if not impossible, for an army.

"The pass of Derbent is formed by a mere ridge, or wall, which advances as it were to close the valley, and slopes down very gradually, leaving but a small opening. This is a complete screen, facing the two sides of the opening through which the road to Koordistan leads.

"The ordinary houses at Sulimania are mere mud hovels, which makes the place look like a large Arab village: they are perfectly exposed, but the people do not seem to regard this, the women going about with the men, and performing their domestic labours without any veil. This miserable-looking town, however, contains five khans, two good mosques, and a very fine bath. The population of Sulimania is estimated by the best judges among the Koords at ten thousand souls, including the officers of government and retainers of princes residing here. The ordinary citizens are of the peasant race.

"The Koords are the only orientals I ever knew who sit up late at night, and rise late in the morning. Few gentlemen in Sulimania go to bed till two or three o'clock, or show themselves abroad till nine or ten in the forenoon. Their chief visiting time is at night. When it grows dark they begin going about to each other's houses, where they amuse themselves with conversation, smoking, and music. They will pay two or three visits of this kind in the course of a night. About an hour before sunset also, a kind of club or assembly is held before the house of the Masraf, in an open place in the town called the Meidan. Friends meet and chat on various subjects; arms or horses are displayed; and sometimes matches are made of wrestling, partridge or dog-fights. The Koords appear to me to be a remarkably cheerful social people, with no kind of pride or ceremony among them; and they are neither envious of one another, nor have I ever heard a Koord speak an ill-natured word of another, however different they may be in party or interest.

"The timber in Koordistan, which is tchinar, or oriental plane, of a fine damasked grain, is cut on the mountains which separate Sinna from Turkish Koordistan, principally in the districts of Juanroo and Delli Havar, which is a valley in the mountains of Hallabjee. Forests are public property in the East; but the neighbouring chiefs generally contrive to exact something, in the way of presents, from the speculator, by throwing all kinds of dangers and obstacles in his way. The wood is cut, cleaned, and left to dry. A year or two after, at the time of the rising of the waters, it is carried to the nearest station, where it is floated down to the river Diala—men attending on the banks to see that it takes the proper course. When it reaches the Diala it is left to its fate, and floats down to the bridge between Bagdad and Tauk Kesra, where it is taken out by persons on the watch, but of course a great deal of it is lost in this way; however, so dear is timber in Bagdad, that it is generally sure to make a handsome profit. Mulberry and nut is also cut in Koordistan, but these are purchased out of gardens. Poplar or kawak is brought from Jezira and Amadia; and willow, or sughuit, from the Euphrates above Ana.

"The town of Sulimania is situated in a hollow, about two miles from the foot of the east range of hills, the *débris* of which slope

down to it; and among these in a sort of ravine it is built. The neighbouring hills are steep and bare; in height they may be about 300 yards. They serve as a reflector to the rays of the sun, which strikes upon them from about seven in the morning until sunset all the summer; and the wind rushing down the face of these hills carries its heat thus acquired to the town, when it blows from the east and north-east. About east of the town the hills recede a little, and the south-east wind is not so bad, consequently, as the north-east, which is the worst point of all.

"*July* 17.—We left Sulimania, after a residence of two months, at twenty minutes before four o'clock in the morning, and took the Giozheh road, as being the easiest through which to pass the chain, or rather wall, of bare hills, which bounds Sulimania on the east. The Giozheh is the most southern of the passes that lead directly over this wall. Next to it, on the north, is the Azmir road, which goes to the city, or rather site of the old city of Karatcholan; and farther north is another called the Gavian road.

"We reached the hills at an opening corresponding with the *col* or eastern head of the glen on our right. Hence Goodroon bore N. 60° W., and from this situation I could form a pretty good notion of the skeleton of that part of the country. The Giozheh, or Azmir, terminates on the north. Goodroon begins before or south of the termination of Azmir, the valley or dell of Margapa being between them. The Goodroon then forms a range more considerable and more rocky than Azmir, which it sends off in a north-easterly direction. We now descended by a very steep road, and kept winding in a *gorge* of the mountains, which were steep on either hand, but that on the right wasmost considerable. The road continually ascended and descended, and was sometimes intersected by valleys. The sides of the hills were covered with vineyards, some of which, in very elevated situations, seemed almost perpendicular, and could certainly only be cultivated by men suspended by cords like samphire gatherers. The principal cultivation hereabouts is the vine and tobacco. We passed some corn which was not yet got in. Dwarf oaks everywhere abounded; and by the little streams in the valley, willows often intervened with the wild vine. None of the grapes were yet near maturity.

"We soon began a very steep ascent, I think the highest and steepest I had yet seen; but the road was excellent. We attained the summit at six, the ascent having occupied about forty minutes; for half an hour of which it seemed, as we toiled up, to be almost perpendicular. Hence the Kazhav bore due west and old Goodroon reared its bare rocky head, in N. 65 W., above all the other mountains. We immediately began to descend by a beautiful and excellent road, among a thick forest of oaks, through which it ran in a zigzag direction, and was not so steep as the ascent. From the top we had a fine view of the plain, winding among beautifully-shaped hills covered with dwarf oak, the background being formed by the high mountains of Persia, whose outline was also extremely picturesque.

Along the plain meandered the river of Kizzeljee, which afterwards runs through a vale on our left, and taking a northerly course, goes through the district of Siwel to discharge itself into the Kiupri Soo. Its source is at the foot of the Persian mountains.

"There is a green frog in Koordistan which climbs trees, and catches flies and locusts like a cat, by striking out with its fore paw. I have often seen it perform this feat. It is in every respect like the common frog, but is of an apple-green colour and smooth skin. I have seen them roosting in bushes at night.

"Keeping the mountains we had just crossed on our right, we arrived at half-past seven at Beestan; which is a village of about fifty houses at the foot of these hills, and curiously thrust in, not in the most advantageous situation, under the foot of an insulated rock, about two hundred feet in height, which cuts it off from the vale through which the river flows, and renders its position close and warm.

"*August* 13.—We left Beestan at five o'clock this morning, and riding through the plain of Tattan or Beestan, crossed the hills which surround it, and descended into the plain before Ahmed Kulwan, or the plain of the Kizzeljee river.

"Penjween, where we take up our quarters for a few days, is a large village, beautifully situated in a glen in the hills, on the south side of the plain of the Kizzeljee river. From this place our old station at Ahmed Kulwan bears about N. 55 W., distant one hour's good pace of a horseman. The old castle of Kizzeljee N. 45 W.

"The peasantry of Penjween look well and comfortable, which is rare in these parts. Their houses are separated by wattled enclosures, and have a neater appearance than I have seen in other parts of Koordistan.

"*August* 20.—The necessary cattle for the transport of the sepoys, the sick, and the baggage having arrived, I resolved on setting out on my trip to Sinna, in which I have for my object the re-establishment of my health, the visiting the chain of Zagros, with its hitherto unknown pass of Garran, and the fixing the position of the capital of Persian Koordistan.

"At six A.M. we entered Persia; the frontier of which is marked by a little wooden bridge over a small rivulet which falls into the Kizzeljee, but is frequently dry. The Kizzeljee river soon after disappeared to the right, behind the hills that now separate the plain, which turns more south.

"On ascending a little eminence at half-past seven, we saw the small but clear blue lake of Zeribar: in the background to the south were the wild rocky mountains of Avroman, through which there are only foot-paths. The left side of the lake was mountainous and wooded. The right side was a plain, evidently at no very distant period occupied by the lake, which has now shrunk to about three miles in length by two in breadth.

"The bare precipices of Avroman bear due south of us, and extend westward, overlooking Shehrizoor; whose plains are separated from

us by the hills which come down from Ahmed Kulwan to Penjween and the lake. Between Avroman and Zagros is a narrow valley, through which runs a direct road to Kermanshah from Sulimania, called the Shamian road. Through this valley flows a little river which comes down from Garran, and falls into the Diala. The chain of Zagros is bare and high. It is visible at intervals from Surena and Ardbaba, which I am now satisfied are part of Zagros. Hajee Ahmed, that part of Zagros to which the Jafs retire in summer, lies from hence N. 60 E. Zagros seems to incline easterly from Ardbaba, in the district of Banna, to Garran, and thence to come out more westerly, in the direction of our road to-morrow.

" *August* 22.—We were off by five, and proceeded through a hilly but open country till six, when we came to the entrance of a narrow valley, formed by two stupendous cliffs, which reared their bare heads above the oak woods that cover their declivities. The small river of Aserabad or Garran flows through the pass, and is crossed by a neat bridge of three arches, built by Aman ullah Khan, the present Vali of Sinna. We had been rising very gently ever since we left the village, but now we began to ascend sensibly, keeping the Aserabad on our left for about a mile. It flows into the Diala. Our direction to the bridge was N. 70 W.,* thence S. 70 E.; the road extremely beautiful, through woods of oak, ash, wild-pear, vine, and tchinar or oriental plane, which cover the hills almost to their summits; and among them we remarked hawthorn and a gigantic wild-rose.

" This pass of Zagros is called Garran, from the name of a peer, or saint, as I am informed, though it is certainly no Mahometan name. The pass of Ardbaba to Banna is reckoned easier. This entrance into Persia is by no means pleasing; every thing looks burnt and bare; and there is said to be no more wood eastward to the frontiers of India.

" Sinna wore a much more imposing appearance than I expected, with its castellated palace on a height, and some good-looking buildings round the foot of it. When we came near the town, we turned off to the right to the garden of the Khosrooabad, which is less than a quarter of a mile to the south-west of the town, and is situated on a slope that runs from the foot of a pretty high hill down to the town. At a distance it looked like a plantation of poplars, the garden having no other wall or defence than this tree very closely planted all round it.

" Sinna,† which was formerly situated on a flat mount, south of the present town, was built one hundred and seventy-five years ago, by an ancestor of Aman ullah Khan's. It now contains about four or five thousand families. There are two hundred families of Jews, and fifty houses of the Chaldean Catholic rite, dependent on the Patriarch of Diarbekir, and in the diocese of Mousul. They have a church and a priest, and are all tradesmen or merchants in a very small way. The Mahometan inhabitants of the town are all Sunnis of the Shafei

* This should be N. 70° E.—Ed.

† The proper name of Sinna is Sinendrij—Sinna is a colloquial abbreviation.

sect. The Vali and his family affect to be Shiyyahs, in order to please the King of Persia.

"Aman Ullah Khan, the Vali of Sinna, is forty-seven years of age, and is said to be a perfect master of Persian politeness, elegance, and policy. The Persians themselves say he can outwit any of them; and all agree that his cunning and duplicity set all precautions at defiance. His manners are represented to be so insinuating, and his *tact* so perfect, that he can gain whomsoever he pleases; but he has always a selfish object in what he does, and no reliance can be placed on him. He is cruel and avaricious even beyond the generality of Persian governors.

"*August* 30.—Quitted Sinna. Immediately after leaving the town we rose, and continued gently ascending all the march. The country was open and tolerably well cultivated. The tops of the hills were broken and craggy; sometimes so much so as to look like ruins. On the sides of the hill we still observed slate and gypsum. Many of the crags seemed strongly tinged with iron. Some of the stones were greenish with micaceous particles.

"*Sept.* 1.—We reached a very steep descent to the Kizzel Ozan, a river of some geographical celebrity.* The source is about two farsahks off to the left or west, in the Abbas Bey mountains. It runs east, and goes hence to Meiandoav. I viewed the stream with the interest with which one sees all great or celebrated rivers in their infant state. There was not above a foot of water in it; but this is extraordinary, and proceeds from the uncommon drought of the season. It is generally up to the stirrups, and frequently unfordable for days together in the spring. The Vali proposes to build a bridge over it.

"At a quarter to twelve, without having ascended considerably, we reached the top of a very steep descent, I think the steepest we had yet met with; it occupied about half an hour, and is called Kelleh Balin. Both Omar Aga and Abdullah Bey agreed in saying it was a pass of Zagros, 30 miles north of our former pass. The two mountains here form a valley which reaches to Banna. Both are wooded with the dwarf oak.

"*Sept.* 7.—The castle, or palace of Banna, or whatever it may be called, is a wretched-looking place. The Khan, or Vale of Sinna was sitting in an unplastered talar, surrounded by a quantity of melons. He rose to receive me, and gave his hand to Mr. Bell and myself. I was much disappointed in his manners and appearance. I had expected to see the dignity and refinement of Daoud Pasha; instead of which I found a plain, rough kind of Persian, and rather an oddity—something of what we should call a good fellow, with no dignity, and nothing remarkable in his conversation, which consisted entirely of abrupt questions and short remarks. In person he is above the middle size, has rather a short thick face, grizly beard, and bushy black eyebrows, which, being straight and contracted, gave rather an unpleasing character to the upper part of his face.

*** The Kizzel Ozan is supposed by Major Rennell to be the Gozan of the Scriptures. See 2 Kings xvii. 6.**

"We left Banna on our road to Sulimania, and crossing the plain in a north-west direction, entered a narrow valley, the hills above which were wooded with dwarf oak.

"We soon reached the top of the descent by which we entered the Bebbeh territory. Here a magnificent sight presented itself. The road led at once down into a deep and narrow valley which the eye could not fathom; on the opposite side, the country rose again to a height even greater than that on which we stood, and was crowned by two summits, united by a curtain, the northern of which was a singularly-shaped hill, which we had noticed from Swearwea. The aspect of the country was enchanting. It was richly wooded, with many villages and patches of cultivation, as verdant as an emerald, in the most picturesque situations. The lines and forms of the mountains were broken in the most beautiful manner.

"Certainly, nothing could be more marked than the difference between *our* Koordistan and Persia viewed from this spot. The very soil seemed to have changed its nature and tint—everything was a mixture of the grand and beautiful. We arrived at the bottom of the descent at half-past twelve, and crossed the Berrozeh or Banna water, which is joined here by other mountain streams. This stream separates Persia from Turkey. It runs north and a little west, and falls into the Altoon Soo above the Karatcholan water.

"This spot is called Hazir Kanian, or the thousand springs. We had here attained the highest part of our road; but still, at a considerable height above us, were Gimmo and its fellow summit, both bare and stony. We continued for some time travelling under them. No road could have been better chosen to give me a correct notion of the chains and connexions of the mountains. Parallel with us was the Soorkeoo range, which, as I suspected, forms the Kizzeljee or Tarder mountain. It sends forth a branch, which sweeps round from the Serseer mountain, and then joins or forms that on which we now are. Behind, or south of this, is the Kurree Kazhav, running about south-east towards the Tarder. The country between is composed of broken hills, ascending to either range respectively. Villages and verdant patches on platforms, and sometimes as it were suspended on the sides of the mountain, diversify the scene.

"*Sept.* 15.—Returned to Sulimania. I have now inspected a most curious and interesting part of Koordistan; scarcely any point of which was known previous to my visit, and which is not likely to be soon visited again by any traveller. And the routes I pursued, which often depended on mere accident, or the impulse of the moment, fortunately always turned out to be the best for giving me a general idea of the country, and the very ones I should have chosen to survey it, had I previously known enough to form a general plan of proceedings."—vol. i. pp. 42—267.

"*Oct.* 21.—We again left Sulimania, after a second residence of six weeks, for Mousoul. We retraced our steps as far as the pass of Derbent, and pursued a west-north-west course towards Altoon Kiupri. Shortly after we quitted Koordistan, and continued over a

far less fertile country. As we approached the lesser Zab, or the Altoon Soo, we passed near a fine corn plain, and descended to the river over immense beds of pebbles, the beds and rocks of the river being concretions of pebbles also. The town is not seen till you descend upon it. . . . . . . We passed over the very sharp high bridge which has been lately repaired, and then through the town and over the other bridge, and encamped on the flat space near the north-west or right quarter.

"The Tigris is eighteen hours' travelling from Altoon Kiupri, and when the river is very full a kellek or raft will go in a day, but at this season of the year it takes three days.

"A little below Kiupri, on the right bank, are some wharfs and store-houses for grain, &c. Here the kelleks or rafts from Keuy Sanjiak unload, and those for Bagdad are made up. The river is *floatable* for kelleks from Keuy Sanjiak to the Tigris. The river just above the town is about a mile broad, but runs off into two arms, which join below, both equally considerable, and leaving the town on an island. Many houses are commonly carried away in the spring. The town then is completely washed by the river, both arms joining round it. On the side of the great bridge the river is confined by a strong bank of concrete pebbles till about the height of the bridge, where the high bank retreats about a quarter of a mile and slopes up gently. On the north side is a low plain, sandy and pebbly, confined by broken hills at about the distance of a mile. This space has evidently at times been filled by the river up to the hills. The Kybeer hills, with flat tops and broken sides, run round our left, and are said to terminate in the Koordish province of Shemamik; and behind these hills, in the direction where the river passes through them, is Karatchuk.

"On the following day we came in sight of Arbil, bearing N. 10° E.; soon after which I took a sketch of it, the view of the high flat mount, probably the burial-place of the Arsacidæ, crowned by a castle, and backed by the Carduchian mountains, being really very impressive.

"Arbil was once evidently very large, probably about the size of modern Bagdad. It is situated at the foot of the artificial mount, principally on the south side, and contains a bath, caravanserais, and bazaars. Some portion of the town is situated on the mount, or what is called the Castle. On the east, or a little north of the town, is a hollow, called the Valley of Tchkunem, where it is said Tamerlane's tent was pitched when he besieged Arbil. A holy Sheikh of Arbil struck a panic into his army, which began to disperse; and Tamerlane is reported to have cried out in Persian, 'Tchekunem?' that is, 'What shall I do?' and this gave name to the valley or hollow.

"The artificial mount on which the castle of Arbil stands is, I conjecture, about one hundred and fifty feet high, and three or four hundred yards in diameter. It was once doubtless much higher, and it is probable the summit of it was ruined by Caracalla.

"*Oct.* 29.—Left Arbil for Mousoul. The mountains seem here to

retire and form a bay eastward; they then advance again about the Zab to the westward. I now can distinguish several chains.

"At eleven o'clock we reached the village of Kellek on the pebbly banks of the Zab. At the place where we crossed it, the stream was, at its narrowest, not above four hundred feet over, but about two or three fathoms and a half deep. The current was very rapid, running at the rate of about two or three knots; the water beautifully transparent, and of a sky-blue colour. In spring it often spreads itself over the whole plain. On the cliff at the passage is the Yezid village of Eski Kellek, where we halted for the night.

"There are four fords in the river between this village and the mouth of the Zab at Kushaff, on the Tigris, which is about five hours off.

"The country between the two rivers, the Zab and the Bumadus, is of an undulating surface, but not broken nor abrupt."

After six weeks spent in examining the ruins of Nineveh, Mr. Rich visited the convent of Syrian Christians, called Mar Mattei, situated 25 miles to the north-east of Mousoul, in the hilly country near the junction of two tributaries of the Ghazir Soo. This convent is perched on a remarkably precipitous hill, and has the appearance of a baron's castle of the 14th century. It seems to have been founded by Mar Mattei, a companion of St. George, A.D. 334. The incumbent in 1821 was an old bishop, assisted by one monk and a young priest. The view from the summit is extensive and beautiful.

"From the terrace of the south tower where we are lodged, we have a noble and extended view, comprising the whole of Alexander's operations from the passage of the Tigris, to the arrival at Arbela, after the battle of Gaugamela. The Bumadus meanders at the foot or southern extremity of this mountain, and I am now told it rises just below Amadia. I can trace the Zab plainly."

From hence Mr. Rich travelled in a north-north-west direction to the convent of Rabban Hormuzd, at about thirty miles north of Mousoul, and to the Chaldean town of Al Kosh, the birth-place and also the burial-place of the prophet Nahum the El-kosh-ite.

"The town of Al Kosh, which is entirely inhabited by Chaldeans, was before us, a little way up the foot of the mountain; and on the right of it, about a mile higher up, in a rocky defile or opening in the mountains, was the Chaldean convent of Rabban Hormuzd, whither we were journeying, and which from this spot wore a most imposing appearance. Nothing was clearly distinguishable but a heavy square building of a dusky red colour, hanging quite over a precipice, like some Lama pagoda. The dark clouds rolled over the summit of the mountain almost down to the convent, and greatly increased the gloominess of its aspect and its apparent height. We seemed to be retreating from the world and entering on some wild and untried state

of existence, when we found ourselves in the rocky strait by which it is approached. The situation appeared to be well chosen for devotion, but devotion of a savage and gloomy character. The hills gradually rose very soon after the slope had terminated. An immense torrent, now dry, had brought down prodigious fragments of rock. Keeping along its edge, we reached at eleven the entrance of the defile, along a rocky and rough road. This defile expands and scoops out the mountain into a kind of wild amphitheatre, in which, not half way up, the convent is situated. It was only the latter part of the road which was very steep. The red building we had seen from afar was part of a church, or rather churches, there being several together. All the amphitheatre, from the top to the bottom, is full of little caves and grottoes, those near the church and extending up the rock, far above it being appropriated to the use of the monks, of whom there are fifty, but only four or five are priests. Each monk has a separate cell, and the communications between them are by little terraces. The rocks are craggy and broken, and of fine harmonious tints, being of freestone, of which the church is built. It is now undergoing a thorough repair in a very neat manner. It stands on a platform elevated from the precipice, but very little of the ancient fabric remains.

"In the afternoon I went to vespers. The congregation of rustic dark-looking monks, together with the gloominess and simplicity of the church, which is merely a narrow arched or vaulted room, with no light but what is admitted from the small dome, might well remind one of the solitude of St. Saba.

"Manuscripts are fast perishing in the East; and it is almost the duty of a traveller to rescue as many as he can from destruction. I sent Aga Minas to-day to hunt for books in the town of Alkosh, and he fortunately procured me a very valuable Chaldean manuscript of the New Testament,* in vellum, of the highest antiquity, and which was fast perishing.

"*Dec.* 25.—Returned to Mousoul.

"From Alkosh people go in seven days to Urmiah; namely, two to Amadia, two to Julamerk, three to Urmiah. From Julamerk to Kotchannes is one day's journey. The Urmiah road does not necessarily pass through Alkosh, but runs very near it. The territory of Amadia is full of Nestorians, Kotchennes† being the place of residence of their patriarch."

After a residence of four months on the site of Nineveh, Mr.

* The most valuable was one obtained at Telkeif, and now deposited in the British Museum, and perhaps the most ancient copy of the New Testament in the Syriac language now existing, having been written A.D. 768.—Ed.

† Among the Koords are many tribes of Christians,—Armenians, Chaldeans, and Nestorians. They reside chiefly about Mousoul and Amadia, and in Armenia; a remarkable colony of Nestorians, as we are informed by the present British Envoy in Persia, is to be found in the almost inaccessible height around Mount Juwar, at the fork of the river Hakiari with the Greater Zab. They are described as brave, industrious, but rude and almost savage in their habits; admitting no strangers among them, and living under their own bishop, who resides at a monastery called Kotchannes, a sequestered valley of this mountainous country. It is a spot well worth notice.—Ed.

Rich embarked on a raft of skins and branches of trees to descend the Tigris, on his return to Bagdâd. On his way he surveyed the river very attentively, and in the appendix gives all the bearings, and distances, and observations. At the ruins of Nimrod he believes he found the Larissa of Xenophon. From Bagdad Mr. Rich went to Bushire, and thence, to escape the insufferably hot weather, he started on the 23rd July for Shirauz.

His description of the pass of Kutal i Dokhter, the Simplon of Persia, which he crossed in his journey, will be read with interest:—

"We proceeded along the plain, and after night-fall, turning to the mountains which bound it on the south, we stood under the black and frowning cliff of the Dokhter, which seemed to bar all further progress; yet up the face of this we were to ascend; how, it was impossible to say, at least by this light. We soon, however, found that an entirely artificial road zigzagged up the face of this perpendicular and gigantic wall. Imagine the Sarmashook, or perhaps something more, not to be crossed, but ascended up from the plain to the summit, and you will have some idea of the Kutal i Dokhter; but far different are the roads. The Dokhter is a most skilfully constructed road, buttressed, levelled, and *parapetted*, so as not to alarm the most timid, and broad enough to allow of several mules abreast. It is in thorough repair, and is almost worth coming to see. It may be called the Simplon of Persia. The rocks must afford some fine scenery by day-light, and trees and shrubs in many parts project from the crevices, and overshadow the road. This is the first ascent, or screen of Zagros. After reaching the summit, we proceeded to the guard-house, or Derbent, where we arrived at twenty minutes to twelve; and here we stayed smoking our pipes and drinking coffee till twenty minutes past twelve. Near the top of the Dokhter I had a walk of a few minutes, as my mule went close to the parapet, and I was foolish enough to look down; when I saw the fire-pot of my calioon-bearer at a very great depth below, almost under my feet. This made my head turn, and I was obliged to dismount before I recovered. From the guard-house we descended by a very gentle slope and excellent road for a little way, into a longitudinal valley of Zagros, between the screen before mentioned, which bounds it on the west, and Peri i Zen, which is its east wall. The valley is narrow and well wooded, both in its area and sides, with oak, some of a very considerable size, and other trees which I could not distinguish. The country now became beautiful, and, as well as I could see, reminded me of my own Koordistan. This valley, which is called Desht i Ber, must be of a great elevation, and the night-air was so sharp as to make us long to be housed. After proceeding through it for about an hour at a good round pace, we began the ascent of Peri i Zen. The road does not zigzag much, nor are there any precipices; but the ascent is stony, and rises among woods of dwarf oak, hawthorn, and broom, of ten or twelve feet high. The more we ascended, Alps on Alps seemed to rise above us, and show we had yet much more to

perform. We met a caravan of Arabs, from the opposite coast, returning from a pilgrimage to Meshed. Continuing to ascend, we reached a caravanserai at three in the morning, and by the pleasure we felt on reaching it now, could estimate the value it must be of in December's snows. It is kept by a few soldiers, and we found an oak-wood fire burning, which was very agreeable. We were not yet half way up the mountain, the whole ascent of which is three hours without intermission.

"*July* 31.—We marched at ten minutes past six in the evening, continuing the ascent almost immediately, the area of the caravanserai itself being scarcely in a level place. As we advanced, new summits seemed still to rise above us, and the ascent appeared to be interminable. From near the top of the pass we saw the lake which terminates the valley of Kauzeroon; and from some of the summits still far above our heads they say the sea is visible. After proceeding for some time along pretty level ground, we descended a little way through fine woods of oak, of gigantic hawthorn, and other shrubs, which gave out a fragrant odour, into the valley of Arjoon. It is of a fine oval form, and terminated on this side by a lake. It sparkled all round with the fires of the Eliauts, some of whom were Arab buffalo-feeders. Wild boars are in prodigious abundance.

"Our elevation in this plan, amid the summits of Zagros, must be very great, in which, however, no snow lies openly. Shirauz has been determined, by boiling water, to be 4500 feet; and it is even *visibly* lower than this plain, and there is a manifest descent from hence to Shirauz the greater part of the way. I suppose this can hardly be less than 6000 feet. The plain is verdant as an emerald at this season. We marched at twenty minutes to six, and soon were engaged among the hills, through a beautiful road well wooded with hawthorn, wild cherry, pear, &c. Flocks of koorkoors, or partridges, were running across the road, scarcely deranging themselves for us, and we saw hares pricking up their ears under the bushes. Lions are said also not to be uncommon, and Mr. Tod heard one roaring the last time he passed this road."

On the 2nd Aug. Mr. Rich reached Shirauz: the impression this city made on him, and his account of the celebrated Jehan Numa, is described in a letter addressed to Mrs. Rich, then at Bombay for her health:—

"My expectations were surpassed in the general view of the town and the plain, and disappointed in the gardens. The town certainly presents itself to advantage, perhaps more so on the whole than almost any other Oriental town I have seen—of course excepting Constantinople. The plain is fine, well cultivated, and pretty green even now, but miserably bare of wood, and the mountains are rocky and barren. The gardens do not surround the town, nor are they by any means so numerous as I had expected. They are scattered here and there, and I have not seen anything that can be compared with the Khosroo-abad at Sinna.

"Our garden, the celebrated Jehan Numa, is one of the best here,

but the house, or bungalow, is in rather a ruinous condition. There is a fine terrace before it, and then a lower garden, much in the Italian style, but it is only two hundred yards square. The mere pleasure-part of the Khosroo-abad was eight hundred. Three or four walks are planted with cypress-trees, but with the exception of these and a few others scattered about here and there in some of the gardens, the cypresses for which Shirauz was once so celebrated have almost entirely disappeared. They have been unmercifully cut down for common carpentry, for doors and window frames, &c. The other day the prince wanted some timber to repair the roof of his kiosk in his garden, and cut down some remarkably fine tchinar trees, which had been much celebrated for their beauty in Kerim Khan's time. I have ordered a neat box to be made for you out of the Shirauz cypress wood, but the trees, however renowned in Oriental song, are not so fine as those of Constantinople."

His visit also to Persepolis,—

"Our first stage was to Zergoon, which we left in the evening of the 16th, and rode along the plain of Persepolis. It was dark when we left the bridge of the Araxes. My expectation was greatly excited. Chardin, when I was a mere child had inspired me with a great desire to see these ruins, and the desires excited in us in childhood are too vivid ever to be effaced. Their gratification has a relish which motives suggested by reason and judgment are unable afterwards to equal. My late antiquarian researches had, however, also added their interest to my other inducements; and as I rode over the plain by the beautiful star-light, reflections innumerable on the great events that had happened there crowded on my memory. I was in the moment of enjoying what I had long wished for; and what a delightful moment that is! At last the pointed summit began to detach itself from the line of mountains to which we were advancing. Mr. Tod pointed it out:—'Under that lie the ruins.' At that moment the moon rose with uncommon beauty behind it. Ages seemed at once to present themselves to my fancy.

"We were lodged in a half-ruined garden-house, fronting the ruins, and at the distance of about a mile from them. You may be assured that my last looks at night and first in the morning (I did not go to bed till twelve and rose with the dawn) were directed to that spot. Yet I took a capricious kind of pleasure in not going to them, and forcing myself to be contented with this general survey. This may be foolish, but I determined to put off my minute inspection of them till our return, and enjoy for the present the general impression caused by this distant view. Lord Byron would have employed the interval better than I could do.

"We returned to Persepolis by partly a different road, and arrived there on the evening of the 22nd. We pitched our tents on the platform, close by the portals, which contain the colossal figures of the mythological animals. You may imagine I could not sleep that night. It was not a situation to steep the senses in sweet oblivion. I

watched the rising of the moon, to indulge myself with a solitary ramble among the ruins by her light, so favourable to contemplation; and I was well rewarded. The strange gigantic figures on the portals near which we were encamped, had a singular and portentous aspect, faintly illuminated by the moon, and by the remains of a fire our people had lighted, which cast a reddish mysterious light on part of them. As I walked among the lofty pillars, numberless were the fancies that arose, and the incomparable ode at once presented itself to my recollection. I was actually walking among the remains of those very 'Persian abodes,' but how changed! The fall of my own footsteps, and the cry of the fox from the hills which contain the royal sepulchres, were the only sounds heard, while above the pale moon was pursuing her tranquil course, unconscious of, or at least unchanged by, the lapse of ages."

The dreadful irruption of cholera at Shirauz, in the midst of the nuptial feast of a royal pair,—

"'Who is it that comes from the bridal chamber? It is Azrael, the Angel of Death.' The festivities of the wedding were suddenly put a stop to by the appearance of the so-much-dreaded cholera. The first death by it happened on the 14th. * * * *

"I hope to take Shapoor on my way to Bushire, for which I shall set out in a few days, please God."

Such was not the will of God. His days were numbered. Mr. Rich died of the cholera morbus on the 5th Oct., 1821, at the early age of thirty-four years.

* * * * *

Besides the journey here described, the Appendix contains a valuable collection of fragments of routes, of observations, and of bearings and distances throughout his routes; affording most valuable materials for filling up the blank in our maps. In the maps accompanying the books, especially that on the large scale, Mr. Walker has made use of these materials with great judgment; and we hope ere long to see the information, which bears on its face the stamp of veracity, transferred to all our maps of Koordistan.

II.—*Reise um die Erde in den Jahren,* 1830, 31, *und* 32. Von Dr. F. J. F. Meyen. Berlin, 1834. (Voyage round the World in the years 1830, 31, and 32. By Dr. F. J. F. Meyen. Berlin, 1835.) 2 vols. 4to.

THE author of this voyage, a zealous naturalist, accompanied as surgeon the Prussian vessel, Princess Louise, which sailed from Hamburg in September, 1830, for the west coast of South America, and for China, on commercial speculations. The vessel touched at Rio Janeiro; Valparaiso and Copiapò in Chile; Arica, Islay, and

Callao in Peru; afterwards sailed to the Sandwich Islands, thence to Canton and Manila, and returned to Europe by the Cape of Good Hope. The stay of the vessel at each place was, of course, limited to a few weeks. Yet the author has considerably increased our knowledge of the natural history, as well as of the geography, of the countries which he visited. He obtained this object by an indefatigable activity, so frequently met with in naturalists, and more especially in German naturalists; and by a great desire to see such parts of these countries which previously had not been visited by European travellers, or of which, at least, no account could be found in their travels.

At Rio Janeiro his stay was very short; and as, during the last twenty years, not less than ten travellers have given an account of the capital of Brazil, he could not add to our stock of geographical knowledge, though his endeavours to enrich natural history were more successful.

From Valparaiso he went to Santiago; from thence he travelled southward to San Fernando, the capital of the province of Colchagua, which lies about eighty miles farther south, but nearly under the same meridian; and from here he visited the Andes and ascended Monte Imposible.* The plain of Mapocho, on which Santiago is built, and which is about 1700 feet above the level of the sea, terminates about ten miles south of the town, where there rise isolated pyramidal hills of green-stone porphyry to two or three hundred feet. They afterwards increase in number and form small chains. These elevations constitute the southern boundary of the plain of Mapocho; south of it, extends another not less extensive plain, which is more fertile and traversed by the Rio Maipù; it seems to be very much lower than that of Mapocho. The bed of the river Maipù, where it is crossed by the road, was half a league wide, though it was at the end of the dry season, and the water very low. South of the Maipù the country is still more fertile, the annual rains being more abundant. The plain extends to a considerable distance from the river, and has for its southern boundary the Cuesta de Perigne, a chain of hills about 700 feet above the plain, which is traversed by a narrow pass, called La Angostura. Then follows the plain of Rancagua, which, like the other, extends along the foot of the Andes; and on the west is enclosed by ridges of low hills. The Rio Cachapoal, which runs through it, is, at the town of Rancagua, wider than the Maipù, but the water did then not fill the whole of its bed, but was divided in four or five wide water-courses. The small streams descending from the Andes are very numerous: the most considerable is the Rio Clarillo, a

* This name does not appear in any of our maps, but in Dr. Meyen's it appears to overhang the pass of Las Damas.

tributary to the Cachapoal. South of this the ground rises to an inconsiderable height, and is traversed by a narrow pass extending about five miles. Then follows another plain, in which is situated the town of S. Fernando, the capital of the province of Colchagua.

From hence Dr. Meyen undertook an excursion into the Andes, along the Rio Tinguiririca, towards the pass of Las Damas. The plain rises suddenly fifty or sixty feet, and continues at that elevation on a level to the very foot of the range. The mountains rise here with great steepness, forming in some places almost perpendicular walls of sienite, rising upwards of 1000 feet. On their summits occur plains of small extent: the lower portions of them, where the declivity is not too steep, are clad with high forest trees; higher up, they are covered with shrubs. Only the middle of the chain of the Andes consists of bare rocky masses, which rise to the snow-line, or nearly so. *Monte Imposible* was at this season (February) covered with snow. The higher part of the mountain consists of a greyish-green porphyry, with numerous and large crystals of hornblende.

Dr. Meyen afterwards visited the Volcan de Maipù, near the source of the river of the same name, whose banks the road follows. The hills and lower mountains, which enclose its channel are clad with trees and rich vegetation. Between the mountains, and three leagues above the junction of the river Colorado, is a fine and wide valley, in which is situated the Villa San Josè. Beyond the mountains again approach the banks of the Maipù; and in them some mines of silver, close to the road, which, by the pass of Portillo, between Tupungato, on the north, and Maipù, on the south, leads to Mendoza. At Tollo, a small village, Dr. Meyen saw a hill 300 feet high, entirely composed of pumice-stone. It is two days' journey distant from the volcano of Maipù, and no other is found in its neighbourhood. About five leagues from Tollo, the narrow glen, through which the river runs, widens to a pretty valley, which is covered with the fruit-trees of Europe, its elevation being so high that heavy snow-falls are frequent; and the snow remains for a considerable time on the ground. At the junction of the Rio del Yeso with the Rio Maipù, Dr. Meyen quitted the road conducting to Mendoza, and entered the mountain-passes. About two miles farther up, the Rio Maipù is joined by the Rio del Valian, which, as well as the Rio del Yeso, comes down from the north-east; but the Rio del Valian is much larger, nearly as wide as the Rio Maipù at their confluence. Here Dr. Meyen estimates the elevation of the valley at 4500 or 5000 feet above the sea. The whole course of the Rio del Valian, along which the traveller ascended, lies in a very narrow glen, whose sides are formed by high and steep mountains, on the declivities of which the road continues at a considerable height above the river. The sides of

the mountains are mostly bare; where the valley is rather wider, are excellent pasture grounds for cattle and goats, at an elevation of about 9000 feet. At the upper extremity of this valley extends a considerable plain, which reaches to the very foot of the volcano, and is covered with a fine turf. Whilst Dr. Meyen passed the night on this plain, and also at other places, he observed successive flashes like lightning, though the sky was cloudless; and he was informed by the natives that they proceeded from the volcanoes. He is rather at a loss to explain why this lightning is observed at the volcanoes of Chile, and not at those of other countries. The volcano of Atacama is the most northern at which this phenomenon occurs: at that of Arequipa it is not observed. Dr. Meyen could not attain the summit of the Volcan de Maipù, being prevented by a deep quebrada, or ravine, which occurs about 500 feet below its summit: the snow and ice extended more than 1000 feet lower down.

We must refer to the work for valuable remarks upon the natural history of this part of the Andes, which Dr. Meyen lost no opportunity of examining. On his return to Santiago and Valparaiso, they sailed for Coquimbo, and then to Copiapò, where he found the town, which, in 1819 and 1822 was almost destroyed by an earthquake, rebuilt, and containing 4000 inhabitants. Shocks of earthquake were so frequent, that during his stay six or seven of them commonly occurred in the space of twenty-four hours. The inhabitants are so used to these occurrences, that when they hear the slight noise by which every shock is preceded, they run directly out of doors; as soon as the shock is passed, return and continue the conversation, as if nothing had happened. Dr. Meyen thinks that no part of America is more subject to earthquakes, and assigns as the reason for this peculiarity the entire want of volcanoes in the adjacent range of the Andes. The volcano of Copiapò, which is inserted in all our maps, does not exist, and it appears that no volcano is found between that of Coquimbo, in 30° S. latitude, and that of Atacama, nearly eight degrees farther north. Hence the countries lying between these parallels on the Pacific are continually agitated by earthquakes. It would also seem, that the Andes in this space rarely rise to the snow-line; for it is observed by the author, that the small rivers which descend from them bring down all the year round nearly the same volume of water; which, between the parallel of 23° and 30°, could not happen, if the mountains were covered a considerable part of the year with snow. It is also confirmed by the great number of passes, which here traverse the range; for in the department of Copiapò alone there exist five mountain-passes, distant from each other about twenty leagues; and many others might be opened without great expense.

The Rio de Copiapò, which waters the valley, does not reach the sea, but is lost in salt pools, about twenty miles from the port, and the whole country around is covered with a thick incrustation of salt; at some distance from it vegetation appears. Between this place and the sea the country is a complete desert. At the village of Ramadilla the water of the river becomes drinkable, and directly the whole aspect of the valley is changed, it being covered with a vigorous vegetation, as far as water reaches. The width of the valley is from one to two miles, and that of the river varies between twenty and thirty feet. A small part of the valley is cultivated, the greater being reserved as pasture for the great number of mules which are employed to bring down the produce of the mines to the port.

Dr. Meyen did not limit his excursion to the town of Copiapò, but travelled in the valley of the river up to Nantoco and Los Hornitos, upwards of thirty leagues from the sea, and about twelve leagues from the highest range of the Andes. At Los Hornitos the produce of the numerous copper-mines found in the mountains east of Copiapò is smelted. The valley is fertile, but only at a few places appeared signs of cultivation. Its elevation above the sea at Los Hornitos seems not to exceed 300 feet.

From the dispersed observations of the author we are enabled to form some idea of the country north of the valley. From the low beach of the sea the country rises suddenly to from fifty to seventy feet, and at that elevation it extends in a nearly level plain, which is called the Desert of Copiapò. Its extent towards the north is unknown, but it seems to join the great desert of Atacama. On the east it reaches to the Monte Algaroba, which runs northward parallel to the coast, at the distance of about eight leagues. East of this range the country is much higher and more uneven, its surface being traversed by low chains of hills, which unite the Algaroba to the Chanchoprin, another ridge running north and south and ending near the town of Copiapò. In the vicinity of this place, the high land enclosing the valley rises with a rather steep ascent to nearly 700 feet above the sea. Near Nantoco its elevation was estimated 1000 feet above the valley, but hence the rise is much more rapid: for at Los Hornitos the mountains attain nearly 5000 feet. Such is the slope of the western declivity in this part of South America.

The partido of Copiapò is rich in minerals. When the author was there, 103 mines were worked: 3 of gold, 24 of silver, and 75 of copper. According to his information, the produce of silver was about 600 marcs, and that of copper 10,000 quintals; the mines of Checo, belonging to an English Mining Company, gave an annual produce of 6000 quintals. The rich silver mines, situate about twenty miles south of Copiapò, in the range of

Chanarcillo and Molte, were not discovered till after his departure in 1832, and his account of them is only drawn from the report in the official newspaper of Chile.

The rich mines of Checo, which at former periods have given even 12,000 quintals, are situated on the high ground north of Nantoco, at a distance of about three leagues, in a very desolate country. The ore is very rich, containing about 70 *per cent.* of copper; nevertheless, the profit of the Company is very moderate, on account of the heavy expenses of transport. Here, as well as in other parts, good roads would much increase the value of the mines.

The most interesting part of Dr. Meyen's work is, perhaps, his journey through the valley of the Desaguadero, in the Bolivian Andes. From Arica he went to Tacna, ascended the western chain of the Andes, by the pass of Las Gualillas, and traversed the high table-land to the great lake of Titicaca, whose banks he reached near the village of Ilave. Hence, along the banks of the lake to Puno, and returned, through Arequipa, to the port of Islay, re-crossing the western chain of the Bolivian Andes by the pass called Altos de Toledo.

Arica, though much resorted to by trading vessels, is a miserable place, only inhabited by people of mixed race, and abandoned by the whites on account of its unhealthiness. Here the goods are landed which are destined for the markets of Bolivia, and of a portion of Peru. The road from Arica to Tacna leads over a desert covered with gravel; not a rock to be seen, and hardly any traces of vegetation. It seems to rise rapidly; for Tacna is, according to Mr. Pentland, 1795 feet above the level of the sea. It lies in a valley from two to three miles wide, and watered by the small river of the same name; it is richly covered with vegetation, and presents a great contrast to the deserts around. Tacna is better built than most of the smaller towns of South America, and contains about 10,000 inhabitants, nearly exclusively occupied in carrying on the commerce between the coast and Bolivia.

Dr. Meyen ascended the valley for one day's journey from Tacna, but found the vegetation in it scanty, whilst the surrounding hills were bare. Beyond the small village of Patchi the road began to ascend the lower declivity of the Andes; the country bare and covered with masses of rock. Higher up in a narrow and deep quebrada, covered with a rich vegetation of trees and plants, the village of Palca is situated, whose inhabitants cultivate the declivities of the ravine; and the temperature allows them to keep llamas. Near this place Dr. Meyen observed some solid quadrangular buildings, about twenty feet high, and eight feet square. They were built of bricks, dried in the sun, and were bound together by metallic bands. The Indians inhabiting the

village said that they had been erected in the time of the Incas; possibly the stone masses, which, according to Herrera, the Inca Topa erected as memorials of his victories over the rebellious inhabitants of this country.

On leaving the quebrada of Palca, Dr. Meyen again ascended very steep acclivities, where the small level places were not entirely without vegetation; but trees had disappeared, and shrubs did not attain their usual size. After an ascent of a few hours he arrived on the exterior edge of the Andes, where the mountain-pass of Las Gualillas, or Guatillas, begins, which runs between the two Nevados of Tacora and Niuta. These two peaks stand near the edge of the range; and the Nevado of Tacora is the more elevated. Dr. Meyen estimates its height at 15,200 feet; but as he says that its upper part, to a distance of 300 or 400 feet from its summit, is covered with snow; and, as according to the observations of Mr. Pentland, the snow-line in this portion of the Andes descends rarely below 17,000 feet; the Nevado de Tacora must be higher.

The accounts of Mr. Pentland and Dr. Meyen do not entirely agree respecting the mountains' summits in this part of the Andes. Mr. Pentland calls Nevado de Chipicani that peak which emits quantities of aqueous acid vapours, which, by their condensation, give rise to the Rio Azufrado; and Dr. Meyen asserts the same of the Nevado de Tacora. Hence we should infer that the Nevado de Chipicani of Mr. Pentland is the Nevado of Tacora of Dr. Meyen. But Mr. Pentland says that the village of Tacora is situated at the south-western base of the Nevado de Chipicani; and Dr. Meyen had travelled some hours eastward from the base of his Nevado de Tacora before he arrived at the village of that name. He calls Nevado de Chipicani a peak, lying many miles farther east, and giving rise to the Rio Utchusoma. We must notice that, in Vol. V. of the Journal of the Society, Mr. Pentland assigns to the Nevado de Chipicani the elevation of 16,998 feet, whilst Dr. Meyen quotes it at 18,898 feet, from the "Annuaire" of 1830, probably a misprint.

"Close to these enormous mountain-masses, at the beginning of the pass, a plain extends from north to east, beyond the reach of sight, and is said to cover an area of more than 3200 square miles. It is entirely a desert, and called El Paramo. In travelling over it on the 2nd of April, between twelve and one o'clock, a very strong wind arose, which, with great force, blew down towards the coast, and produced so great a degree of cold, that I was glad to wrap a woollen cloth about my head. These cold winds cover the sky at Tacna with clouds between three and four o'clock in the afternoon, and produce the low temperature of the air along the coast of the Pacific in these parts of Peru. Towards evening they cease to blow, and are replaced by more moderate winds from the opposite quarter."

Tacora consists of a convent of Franciscan monks, and a few huts. It is, according to Mr. Pentland, 14,275 feet above the sea. Three leagues farther east is a lake of considerable extent where water-fowls abound. The temperature of the air on this table-land was at this season (April) so low, that, during the night, the rivers were covered with ice, strong enough to be safely passed in the morning on horseback.

The Rio *Utchusoma,* which issues from the Nevado of Chipicani (of Dr. Meyen), traverses the plain, and running towards south-west descends from the western declivity of the Andes, and flows at no great distance south of Tacna to the Pacific. For more than half a century much has been spoken of bringing the waters of this river to the valley of the Rio de Tacna by a canal; but the obstacles will probably be found too great.

In proceeding along the plain, Dr. Meyen observed several other peaks, covered with snow, as well to the south, as to the north-west, which have not yet found a place on our maps. The surface of the plain is entirely formed by trachyte rocks, of a white colour, which frequently are disintegrated to such a degree that they are changed into very fine sand. Only where there are running waters the surface is covered with grass and low bushes, and affords pasture to herds of guanacoes.

The route of Dr. Meyen lay to the north-east. At the end of the plain the ground rose, and soon afterwards he arrived at the Rio del Caño, a tributary of the Rio Maure, which falls into the Rio Desaguadero of the Lake of Titicaca. Though here is the line of separation of waters running west and east, the country continues to rise towards the north-east, where it joins the base of a range of mountains, which presents several snow-clad summits. "This range, which constitutes the chief watershed," says Dr. Meyen, "runs parallel to the chain of mountains which we had traversed." It would, therefore, appear that both the western as well as the eastern range of the Bolivian Andes consists of two collateral chains, of which that on the outside is the higher, and that towards the lake of Titicaca the lower. But whilst the inner ridge of the eastern range, according to Mr. Pentland, rises to an inconsiderable height above the level of the valley, and the outer ridge frequently much above the snow-line, the account of Dr. Meyen tends to impress us with the idea, that both ridges of the western range attain a great elevation, though even here the inner one seems to be the lower. These double ridges, however, have till now only been found in the ranges lying north of 17° S. lat.

After having passed the Rio Maure and the Rio Chulañano, its tributary, on the banks of which is the village Morocollo, the author arrived at the foot of the inner high ridge, where he found a high peak covered with eternal snow, whose name, however, he

was unable to learn, and which he called El Volcan Viejo. He estimated its elevation above the plain at 3000 or 4000 feet. He farther thinks that its base may be 1500 or 2000 feet above the village of Tacora, or 16,000 feet above the sea. The summit of this nevado, therefore, would be from 19,000 to 20,000 feet of perpendicular height. The vegetation at the base seemed to confirm his estimate of its elevation. For the same shrubs, which at the Altos de Toledo (which is 15,500 feet above the sea) attain an height of from one to one and half feet, are here at the base of the Volcan Viejo only from five to eight inches high. This volcano is now extinct, but the great space of the ground which at its foot is covered with lava to a distance of many miles, shows its former activity.

From this point Dr. Meyen began to descend towards the level country which surrounds the great lake of Titicaca. He passed first through the valley of the Rio de Pisacoma, which falls into the lake, and found its banks covered with hard and long grasses, similar to those of the Pampas, on the eastern side of the Andes. While at the village of Pisacoma, he discovered in the neighbouring mountains the wild potato-plant. It had finished blossoming, and its tuberous roots were the size of peas, and of a very bitter taste. One league from the village of Pisacoma, towards the north-east, begins the plain which extends along the south-western shore of the lake of Titicaca, and is said to continue in a southern direction along the Rio Desaguadero up to the mountain-knot of Porco (about 19° 30′ S. lat.). The mountain-ridge on each side of the lake is composed of red sandstone. This plain is little cultivated, and as it is at least 13,000 feet above the sea, agriculture is limited to a few objects. The principal are potatoes and quinoa (*Chenopodium quinoa*, L.), rye, barley, and oats, but they do not ripen to seed.

The hordes of domestic animals are numerous, consisting of llamas, sheep, horses, mules, asses, pigs, and a few cattle.

Near the small village of Piche-pichun, the silver mines were formerly very rich. Two leagues before reaching Ilave, on the shores of the lake, he came to the great road, called Camino del Rey, made in the reign of the tenth Inca, which runs round the whole lake and as far as La Paz. It is built of stone, from four to five yards wide, and sometimes several feet above the surface; but is now in so bad a state that it is generally avoided. From Ilave, which lies near the mouth of the river of that name, he passed along the lake through Acora, a town of 3000 inhabitants, and Chuquito, of 5000, to Puno. To Puno, Dr. Meyen, as well as General Miller, assigns 9000 inhabitants, but Mr. Pentland only 5000 (in 1827).* The lake, Dr. Meyen says, is commonly

* In "Annuaire" for 1830.

called Laguna de Puno, and that the name of Titicaca is only known to a few educated persons; nor is it known which of its numerous island was formerly called Titicaca. It appears dotted with small steep islands.

"The low banks of the lake," he continues, "are lined with rushes; and farther inward its waters are covered with *Myriophyllum chuquitense*, a new species. Rushes are here a plant of great utility, being employed by the natives almost for as many uses as the bamboo in the East Indies. They supply here the place of wood, which is wanting throughout the whole valley of the Desaguadero. The huts of the poor are made of rushes, as also mats for the floor and bed-covers. The boats, with which the rivers and the lake are navigated, are also made of rushes twisted together; the rudder and the mast alone are of wood, and form one of the most valuable possessions of the poor natives. These boats are frequently made with great taste and ingenuity. The smaller ones carry only three or four persons. The larger venture to some distance from the banks of the lake, which, even in calm weather, is subject to a heavy swell. The lake abounds with fish and waterfowl."

The lake of Titicaca is, according to Mr. Pentland, 12,795 * feet above the level of the sea, and Puno, 12,832 feet. Though higher than the plain of Tacora, Dr. Meyen found the temperature of the air not so low as there; and he considers this circumstance justly as a confirmation of the observation, that the temperature of an extensive table-land is always higher than that of the declivity of a mountain situated at the same elevation above the sea. Here follow some observations on the climate of the valley of the Desaguadero, extracted from papers sent by Mr. Pentland to Baron Humboldt, and by him communicated to Dr. Meyen. As we are not aware that these observations have ever before been published, we would direct attention to them, as we have not space to extract them.

As the culture of Indian corn does not succeed above an elevation of 12,000 feet, nor that of the lucern at 11,000 feet, neither of these plants is grown in the valley of the Desaguadero. Dr. Meyen has inserted some observations of the naturalist Rivero, drawn from his work, "Memorial de Ciencias Naturales," respecting the different elevations at which several plants are cultivated on the Andes; but for which we have no space.

The mines of the province of Puno, in the seventeenth century, were only inferior to those of Potosi. They were afterwards neglected, and only towards the end of the last century they again began to be worked with activity. In 1805 they yielded 96,528 marcs of silver. The annual average produce between 1796 and 1820 amounted to nearly 30,000 marcs: since that time they have

* Journal of Geographical Society, Vol. V.

been again neglected; and in April 1831 only one mine was worked which belonged to an Englishman.

From Puno the author returned to the sea by Arequipa. After having traversed the low ridge, which encloses the plain of Puno at a distance of from two to three leagues from the lake, he came to a plain of uneven surface and of considerable extent, covered with a fine sward of grass, on which herds of llamas and sheep were pasturing. In the valley-like depressions of this plain, flow some small rivers to the Rio Jussecano, which runs in a deep bed between rocks, and is one of the largest rivers falling into the lake of Titicaca, probably the same which by Mr. Pentland is called Rio de Lagunillas. One of its sources is in an alpine lake, situated near the road, which is called Laguna Compuerta; and not far from it is another lake called Lagunilla, whose elevation is according to Rivero 15,255 feet above the sea. Near these lakes extend some plains yielding excellent pasture ground; then follow plains, with scanty vegetation, until the highest part of the pass called the Altos de Toledo is attained. The elevation according to Mr. Pentland is 15,528 feet above the sea; Rivero found it somewhat more than 150 feet higher. Near it rise some steep, conical hills to the height of about 500 feet, and these more correctly are called Altos de Toledo. The temperature here was very low, and at half-past four o'clock ice began to be formed on the waters, though the sun had not yet set; yet the vegetation indicated a higher mean temperature than at the pass of Gualillas. S.W. of the pass stands the volcano of Uvinas (or Uvillas), which was nearly bare of snow, and had an immense crater on the east side. Hence the author proceeded by a steep descent to Pati, more than 1000 feet lower (Pentland 14,402 feet, Rivero 14,167 feet above the sea). In the morning the whole country was covered with ice and hoar frost. Between this place and Apo, seven leagues distant, he crossed a level plain, five leagues in length, covered by a thick stratum of white clay, but entirely destitute of vegetation. Apo, according to Mr. Pentland, is only forty-nine feet lower than Pati. The distance between Apo and Arequipa is only eleven leagues by the road, probably only eight leagues in a straight line; but the difference of their elevation is not less than 6556 feet. The country is almost entirely destitute of vegetation.

" *Arequipa* is situated in a widely-extended vale, everywhere inclosed by mountain-ridges. On the east rises the high range of the Andes, with a few snow-capped peaks. To the north-east rises the Volcan de Arequipa, whose conical peak, standing quite isolated, reaches to more than 6000 feet above the adjacent ridge; the south-western side of its summit also retains perpetual snow. To the west of the volcan extend the Montes de Charcani, which are full 3000 feet lower; yet these heights are always covered with snow. The ridges, which inclose

the valley on the west and on the south, do not rise to any height, yet the Alto Primiero, on the south-west attains a considerable elevation. The vale is watered by the Rio del Volcan, also called Rio Chila, on the bank of which the town is built. This river rises in the Andes, flows round the base of the volcan, passing between it and the Montes Charcani, and then enters the level ground of the vale. Its banks are very steep, and covered with luxuriant vegetation. Two leagues below the town it is joined by the Rio de Socovaya, and hence is called the Rio de Arequipa.

"Though this valley is very fertile, it offers little variety to the eye of the traveller, there being few trees, and the surrounding mountains scantily covered with vegetation."

Dr. Meyen attempted to ascend the volcano of Arequipa, but did not attain its summit, being seized by the *sorocho*. On quitting Arequipa he went over a rather desert country, till he passed the Rio de Arequipa, which flows through a wide, fertile valley, thence over the ridge called *Alto Primiero*, 1000 feet above the plain. Except some species of cactus, no plants are found on these heights. Immediately beyond he crossed another ridge, called *Alto Segundo*—no plant, no insect, no bird was to be seen. A third mountain-ridge succeeds of a similar description, named *Cuesta de Hedrachilar;* three hours hence he reached *Tambo*, 2842 feet above the sea, and where there is a spring and some gold mines: thence he entered on the *Pampa Grande*, a level plain covered with sand, without any rock, water, or trace of vegetation.

This desert, which may have an elevation of about 2000 feet above the sea, extends westward to the chain of hills which skirt the shores of the Pacific; its surface offers a very remarkable appearance.

"Everywhere the sand is formed into waves representing the figure of a scythe, its concave side lying to the north by west. Their extremities from 20 to 70 paces distant from each other, and the height of the hillocks varying between 7 and 15 feet. On the convex side the descent is very gentle, but on the concave, or interior side, these hillocks rise at an angle of 75° or 80°. The surface of the exterior side is not smooth, but a little undulating. The distances at which these sand-hills stand from one another differ; sometimes two or three of them are so close, that their points are united together. In the middle of the Pampa there is a space from 100 to 200 yards wide, where the concave side by degrees turns towards the west, till it faces due west; but a little farther on they return to the former position of N. by W."

Dr. Meyen is somewhat puzzled how to explain the formation of these sand-hills and thinks they are not met with in any other part of the globe. But L. Pottinger found a very similar kind of sand-hills, covering a considerable portion of the great desert of Beloochistan.

The chain of hills which divides the Pampa Grande from the sea is about four leagues wide, and is partly covered with plants and low shrubs, among which rise numerous cacti in the form of candelabra. Having traversed this chain, which in some parts rises to a considerable height, Dr. Meyen arrived at the Port of Islay, the new harbour of Arequipa.

From Islay Dr. Meyen sailed to Callao. In this passage he found that along the coast of Peru, between 15° and 16° S. lat., the temperature of the water instead of increasing, in the short time of four hours decreased about 2° Fah. He gives also the observations made in 1826 by Baron Dirckinck von Holmfeldt on the same subject, and sent by him to Baron Humboldt, which are worthy of notice. Baron Dirckinck found the temperature of the water in the harbour of Callao in March, 67°, whilst without the current it rose to from 79° to 85°.

Dr. Meyen visits Lima, and describes its scientific and literary institutions; he also determined its long. at 77° 8′ 30″ W. of Greenwich, by an eclipse of one of Jupiter's satellites. From Peru Dr. Meyen visited the Sandwich Islands, and passed some time at Oahu; he made frequent excursions from the town of Honoruru into the interior; visited all the ranges of mountains which traverse the island, and gives some account of the four volcanic craters. From the Sandwich Islands Dr. Meyen visited Canton, and then Manilla, where he obtained permission to visit the interior of the Island of Luçon, a favour rarely granted to foreigners, and only to him as a naturalist. He made two excursions, one to the cavern of San Matteo, and the other to the Laguna de Bay.

The visit to San Matteo, which seems to be a large cavern in a limestone mountain named *Sablayan*, estimated at 1500 feet above the sea, is curious and well worth notice; and also that to the *Laguna de Bay*, or Bahia—which is described as having its western shores low, fertile, and populous. Islands in the middle of the lake attain the height of 300 feet, covered with forest trees; while on the eastern shores the mountain ranges rise from 4000 to 7000 feet, whence descend to the lake numerous rapid streams. A rich mould and luxuriant vegetation were found in all the districts visited. The climate Dr. Meyen thinks healthy, and not subject to severe diseases, although in so low a latitude as 15° north. The whole of the 14th and 15th Chapters, containing an account of the island of Luçon and its native inhabitants, is curious and valuable from the dearth of information respecting it, but want of space forbids longer extracts. Dr. Meyen concludes with a set of meteorological tables registered four times a day during his whole voyage; and in a short appendix gives his observations on the specific gravity of salt water in the various spots he visited during a space of three years, and in a voyage round the globe.

III.—*Journey through Arabia Petræa to Mount Sinai, and the excavated City of Petra, the Edom of the Prophecies.* By M. Léon de Laborde. London, 1836. 8vo. pp. 331.

THAT portion of Asia commonly known by the name of Arabia Petræa—the Idumæa of former ages, and the Edom of prophecy—possesses a deeper interest on account of the historical and religious associations which cling to it, than even on account of its extraordinary natural conformation. The work of M. de Laborde is yet another testimony to the literal fulfilment of that remarkable prophecy delivered nearly five-and-twenty centuries ago—"Edom shall be a desolation."

But such is not our province—be it our task, in giving a brief analysis of the volumes before us, to point attention more particularly to those parts which have not been before described by the various authors who have written on this country, from the time of Peter von Suchen and Frescobaldi, in the fourteenth century, down to Niebuhr, Volney, Seetzen, Burckhardt, Irby, Mangles, and Henniker.

M. Léon de Laborde, the son of one of our distinguished Honorary Members, Count Alexandre de Laborde, well known by his sumptuous and valuable works on Spain, Austria, &c., with his travelling companion M. Linant, left Cairo on the 25th of February, 1828, and the object of his journey may be given in his own words:—

"To look for a fragment of stone in the northern part of the isthmus of Suez, where we entertained a hope of finding the Persepolitan monument mentioned by the Egyptian Commission; to visit Suez, the wells of Moses, the baths of Pharoah, and Sarbout el Cadem; to halt among the tribe of Oualed Said; to proceed to Akaba, passing by the north of Sinai; to send for the Alaouin chiefs; to penetrate to Wady Mousa; to remain there as long as possible; to return by a different route to Sinai; to pass through Ras Mohammed, Tor, Wady Faran, the convents of Serbal, Wady Mokatteb, and then return by Suez to Egypt."—p. 49.

From Cairo the travellers crossed the desert to Suez, and following the eastern of the two Wadies which extend in a N. W. direction from Mount Sinai, they reached Wady el Mokatteb, remarkable for its Sinaitic inscriptions there, Sarbont el Cadem, and examined the celebrated monuments, tombs, &c., which M. de Laborde thinks are certainly Egyptian; thence they descended towards the Elanitic gulf, by the great Wady Zackal. On emerging from the Wady Cheick, the traveller perceives Mount Sinai, o'ertopped by Mount St. Catherine, both at this season capped with snow. The Wady Zackal is the wilderness of Sinai, which leads by a continued declivity in an easterly direction to the coast of the Red Sea, and is thus described:—

"The route on which we now entered was the most singular that the imagination can picture. The valley, shut in within a width of about fifty paces by masses of granite, of from a thousand to twelve hundred feet in height, which often rose like perpendicular walls even to their very tops, exhibited the appearance of a Cyclopean street, the ravines branching out from which, on each side, seemed to be adjoining streets, all belonging to some ancient and abandoned town. The extraordinary shapes and immensity of the masses accumulated on the right and left were calculated to terrify, and almost overwhelm the mind; an effect which was not a little augmented by the enormous fissures that occurred here and there, presenting huge fragments which had tumbled from the summit of the mountain. The silence prevailing all around us was that of the grave: the wind was unheard amidst these almost subterraneous passages, the sun touched with its golden hue only the most elevated points, and the tranquillity of the place would have been undisturbed, had not every step and every sound of our voices been re-echoed from the steeps on each side as we pursued our way."—p. 89.

From Dahab, the Midian of Jethro, or the Elanitic gulf, they continued their journey to the north-east as far as Akaba, at the head of the gulf, where they met the Alaouin chiefs, and arranged with them to be conducted safely to Petra. Their route led in a N.N.E. direction for sixty miles, along the Wady Araba, the plain of Ezion Gaber; as they approach their destination M. de Laborde says,

"We wound round a peak, surmounted by a single tree. The view from that point exhibited a vast frightful desert—a chaotic sea, the waves of which were petrified. Following the beaten road, we saw before us Mount Hor, crowned by the tomb of the prophet, if we are to credit the ancient traditions preserved by the people of that country. Several large and ruinous excavations, which are seen in the way, may arrest the attention of a traveller who is interested by such objects, and has no notion of those still concealed from his view by the curtain of rocks which extends before him. But at length the road leads him to the heights above one more ravine, whence he discovers within his horizon the most singular spectacle, the most enchanting picture, which nature has wrought in her grandest mood of creation, which men influenced by the vainest dreams of ambition have yet bequeathed to the generations that were to follow them. At Palmyra nature renders the works of man insignificant by her own immensity and boundless horizon, within which some hundreds of columns seem entirely lost; here, on the contrary, she appears delighted to set in her own noble frame-work his productions, which aspire, and not unsuccessfully, to harmonise with her own majestic yet fantastic appearance. The spectator hesitates for a moment as to which of the two he is the more to admire—whether he is to accord the preference to nature, who invites his attention to her matchless girdle of rocks, wondrous as well for their colours as their forms, or to the men who

feared not to intermingle the works of their genius with such splendid efforts of creative power"—p. 147.

The vast necropolis of Petra is before us.

Burckhardt was the first who, in later days, attempted to visit the remains of Petra. He entered by a ravine to the south-east, and had gone some distance when his guide refused to proceed any further. Captains Irby and Mangles, and Messrs. Bankes and Legh, were the next who succeeded in effecting an entrance by the same pass as Burckhardt; but they, too, after having spent part of two days among the ruins, were obliged by the fears of their guides to abandon the spot. Messrs. Strangways and Anson also visited the valley, but an account, we believe, was not published. M. de Laborde has been more fortunate; he entered at the south-western angle of the city, and was enabled to remain eight days, during which he and his companion thoroughly examined and sketched this remarkable city. Many of the monuments had been before described, but one on the north side, called El Deir, or the Convent, the most distinguished by its size and beauty of workmanship, was never before visited. M. de Laborde says,

"This astonishing work of art exhibits a compact mass, a monolithe monument, in fact, of enormous dimensions, by way of ornament in front of the mountain. Its preservation is perfect; it would be difficult to say as much for its style. The vastness of its dimensions, however, compensate in some degree for its defects; and even the fantastic character which it presents is curious with reference to the history of the arts, when compared with the different edifices which were constructed about the time of their revival. It forms a link between their decline in the thirteenth and fourteenth centuries, and their restoration in the fifteenth.

"While I was copying this grand architectural production, M. Linant took its measurements; we then examined its environs. In front of it there is a lofty rock, to which an artificial ascent is formed; we found on the top, on a level platform, a line of columns, the bases of which are still in their places, and a subterraneous chamber, at the bottom of which there is a niche, sculptured with great care, though in an extremely defective style. From this platform we enjoyed a most extensive view; the eye commanding, on one side, the monument of El Deir and the valley of Mousa, and on the other, the chaos of rocks which are piled at the foot of Mount Hor."—p. 182.

Our traveller returned from Petra to Akaba, by crossing part of the mountain range which forms the eastern boundary of the Wady Araba, and descending the Wady Jetoum. On the route many ruins were found—remains of an ancient road—and traces of former civilization; indicating clearly that this now deserted and desolate country was formerly fruitful and populous. From Akaba, M. de Laborde retraced his steps to the south-west,

visited the small port of Tor on the east coast of the Gulf of Suez, and then Ras Mohammed, the southern extreme point of separation between the two gulfs. He afterwards ascended to the Convent of St. Catharine, Mount Horeb and Mount Sinai.

"Our course towards the summit of Sinai lay through a ravine to the south-west. The monks had arranged a series of large slabs in tolerably regular order, which once formed a convenient staircase to the top of the mountain. The rains, however, have disturbed them, and, as no repairs had been for a long time attended to, the stairs were in many places in ruins. Just before reaching the foot of Sinai, immediately after quitting Horeb, the traveller sees a door built in the form of an arch; on the key-stone of the arch a cross has been carved.

"We climbed with difficulty to the top of Sinai, resting at each cleft or salient part of the rock to which some traditions have been annexed by the inventive faculty of the monks, who have communicated them to the Arabs, always ready to listen to narratives of this description. Arrived on the summit, I was surprized by the briskness of the air. The eye sought in vain to catch some prominent object amid the chaos of rocks which were tumbled round the base, and vanished in the distance in the form of raging waves. Nevertheless, I distinguished the Red Sea, the mountains of Africa, and some summits of mountains which I easily recognised by their shapes.—Schommar being distinguishable by its rounded masses, Serbal by its shooting points, and Tih by its immense prolongation."—p. 240-41.

This volume is illustrated by various admirable sketches by M. de Laborde, and also by a plan of Petra, and a map respectable in its details—but erroneous in its positions. As it is mentioned that the travellers were well provided with instruments, we have searched for some little addition to our stock of geographical knowledge—as positions of places, heights of mountains, &c.—but we have not found them.

IV.—*Reise in Chile, Peru, und auf dem Amazonenstrome während der Jahre* 1827-32. *Von E. Poeppig.* (Travels in Chile, Peru, and on the Amazon River, in the years 1827-32. By E. Poeppig, Professor at the University of Leipzig. 2 vols. 4to.

It is remarkable that, during the short space of seven years, from 1828 to 1835, not less than three European travellers have crossed the whole breadth of South America, from the Pacific to the Atlantic Ocean, descending the mighty stream of the Amazons, first explored by the intrepid Orellana, just three centuries ago; viz., Lieut. Mawe, R.N., in 1828; Dr. Poeppig, in 1831; and Lieut. Smyth, R.N., in 1834. The narratives of two of these expeditions are well known: the work of the eminent German naturalist

not so much so; therefore, at the risk of repetition, a brief analysis is here offered.

Some few years since, several gentlemen of Germany, desirous of promoting the study of natural history, united for the purpose of sending a person to South America, to enrich the natural sciences with some of the inexhaustible treasures that continent offers, in nearly every direction. Their choice fell on the author of the work before us. Dr. Poeppig sailed from Baltimore in 1827, by way of Cape Horn, to Chile, where he remained two years; the first summer he spent in the valley of Aconcagua, and the countries lying between it and Santiago. He here enriched his collections of natural history: his geographical notices only confirm the accounts of Miers, with the addition of some details respecting the great range of the Andes dividing Chile from La Plata.

He passed the second year in the south of Chile, partly in the harbour of Talcahuano, near Concepcion, and partly on the range of the Andes, at the base of the Volcan de Antuco. He traversed a country, of which it is believed no account exists, except the general observations in Molina; and hence the information may be considered valuable. We learn that the districts of Chile extending along the sea, are sandy hills and valleys of very inferior fertility; but that along the base of the Andes, which here, as everywhere south of 33° S. latitude, rise with a steep acclivity, extensive plains occupy the country, which are separated from one another by low ranges of hills. Most of these plains are fertile, as the Isla de Loxa. His account of the Andes, which, in their aspect and natural productions, differ more materially from those in the vale of Aconcagua, is very instructive, and not less so is that which he gives of the volcano of Antuco, which is still active, and rises some height above the line of perpetual snow.

From Talcahuano Mr. Poeppig sailed to Callao and to Lima. Leaving the metropolis of Peru, he went in a north-eastern direction to the high table-land of Pasco. In ascending thus the western acclivity of the Andes, he traversed the valley drained by the Rio Chillon. At its upper extremity he passed over the western ridge of the Andes, called the Sierra de la Viuda, by the passes of Alto de Sacaibamba (15,135 feet above the sea), and of Alto de Lacchagual (15,480 feet according to Rivero); and observes that the line of perpetual snow is at least 950 feet above the former, reaching 16,060 feet, more than 300 feet higher than given by Baron Humboldt, under the equator. He then entered the plain of Bonbon, in which the rich silver mines of Pasco are situated, which extends upward of six leagues in width from east to west.

The greatest part of the waters collected on this plain run to the

lake of Lauricocha, the source of the Amazon. We have not space to enter more particularly into his detail of this remarkable longitudinal valley of the Andes. The Cerro de Pasco, in whose neighbourhood the richer mines are situated, is an irregularly built place, with about 7000 * inhabitants, and stated at 14,280 feet above the sea.

From the Cerro de Pasco the author gradually descended in a northerly direction by the eastern declivity of the Andes, to a valley traversed by the upper branch of the Huallága, called Huanuco. At Cayamarquilla, a village more than three leagues from the Cerro, the ground had already so much lowered, that he found there plantations of vegetables: trees made their appearance lower down; and at San Rafael, he saw the first fields of wheat, which ascends in the valleys of the Andes to an elevation of 9000 feet. Before reaching the town of Huanuco, the level part of the valley was covered with sugar-cane plantations, and even the less steep declivities of the mountains on both sides cultivated.

Mr. Poeppig followed the course of the Huanuco, or Huallága, from its source to its mouth. This river, which traverses more than five degrees of latitude, rises in the plain of Bonbon, in the Laguna Chiquiacoba, not far from the Cerro, at an elevation of 12,200 feet above the sea. This alpine lake is only by a low ridge of hills separated from the Laguna de Quiluacocha, from which the Rio Mantaro, one of the principal branches of the Apu-rimac, issues under the name of Rio de San Juan. The Rio Huanuco runs first north as far as the town of Huanuco, then east about fifty miles, with great violence through a rather narrow vale, and then turns suddenly to the north-north-west and north, which course it pursues to its junction with the Amazon.

Lieut. Smyth has so recently descended this river as far as the junction of the Chipurana, in about 6° 10′ S. latitude, that we do not extract Dr. Poeppig's account. From this spot the Huallága enters the wide plain of the Amazon; and here too another British officer, Lieut. Mawe, embarked on the Huallága, and descended it to the Marañon.

The author remained nearly two years in the country traversed by the Rio Huallága; and his book is full of interesting details on the climate, productions, and geography of that country. His minute descriptions are the more instructive, as he is, as far as we know, the only traveller who has remained long enough there to observe the characteristic features of this part of the Andes.

" Most of the large rivers," says the author, " descending from the Andes enter the plain lying to the eastward by Pongos, (*Puncu* signifies ' a gate ', in the Quichua language). The most noted is the

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* From 12 to 16,000; Lieut. Smyth, in 1834.

Pongo of the Marañon called Pongo de Manseriche. It is seven miles long, while that of the Huallága is only about three miles in length. The bed of the latter is from 300 to 400 paces wide, and it is only during the floods that the Indians are unable to ascend it in their boats. The steep declivities of the mountains inclosing it on each side rise to a great elevation; the highest to the westward may attain 7000 feet above the surface of the river."

Below the Pongo the Huallága flows through the plain of the Amazon river, dividing frequently into numerous arms, which reunite again, and form islands. The village S. Antonio de Laguna, which at the beginning of the present century contained a population of 2500 Indians, was only inhabited by about 250 when our author was there. On approaching the mouth of the Huallága, he found that the waters of the Marañon had been increased by the rain to such a height, that the current of the Huallága for a considerable distance from its mouth was running upwards, carrying with it a great number of large forest trees. The Huallága is wide where it unites to the Marañon; which latter at this point is more than a mile across, and at that season about two feet above the level of the water in the Huallága. The banks of the Amazon, between the mouths of the Huallága and Ucayali, are extremely low.

Passing down the river, Dr. Poeppig came to Nanta, a new settlement on the northern bank, about ten miles above the mouth of the Ucayali. It is built on the highest ground of the upper Marañon, after its issue from the mountains; and in the dry season the village is more than ninety feet above the level of the river. From an itinerary which indicates the stations and distances between Moyobamba, situate in one of the lateral valleys of the Huallága and Quito, *viâ* the Rio Napo, we learn that about two days' journey from Quito the road goes over the Paramo de Guamani, a mountain-pass never free from snow. The Rio Napo does not appear to have any rapid up to Santa Rosa, where the navigation ends; nor are there any settlements of white people, except perhaps at Santa Rosa.

Respecting the Marañon, or upper course of the Amazon river, he observes, that any vessels not drawing more than twelve feet water may safely ascend it as far as the mouth of the Huallága, but the person who conducts its course must be well acquainted with the river, and the vessel remain in the bed of its principal current; the current only at a few places exceeds five English miles an hour. In speaking of the rising of the waters, he says, that the yearly inundations take place with great regularity, but that in the upper course of the river there occur lesser swellings, by which its level is raised from one to three feet, and are more frequent the nearer to the mountains, do not depend upon the season, take place suddenly,

and disappear in the same way. At Ega, near the mouth of the Teffee, they do not occur, at least not in summer. The great swelling during the rainy season occurs sooner in the Solimoës, or middle course of the Amazon river, where it begins to be very perceptible, about the middle of December, whilst in the Marañon that event does not take place before the middle of January. This depends upon the difference of the seasons, because west of Savary the rainy season sets in a month later, than east of that river.

From Ega down the Amazon to Para, Dr. Poeppig hastened without any delay, as civil war—that scourge of South America—was on the point of breaking out, and thence returned to Europe, after five years' wandering in the wilds of the New World, laden with 17,000 specimens of dried plants—some hundred stuffed animals—many new plants, before unknown—three thousand descriptions of plants—numerous other natural productions—and many sketches of scenery, sixteen of which are published. Since the work of Baron Humboldt, there is probably in no language of Europe so full an account of the countries of South America and their productions—of their inhabitants and the social and political state they are placed in by their new situation—as in this highly-interesting work of Dr. Poeppig.

V.—*Etudes de Géographie Critique sur une Partie de l'Afrique Septentrionale.* Par M. d'Avezac, Secrétaire Général de la Société de Géographie de Paris, Corr. Mem. R. G. S. of London.

Under this simple title will be found one of the most important works relating to the geography of part of Northern Africa that has been published for some years.

M. D'Avezac, Secretary to the Geographical Society of Paris, and Corresponding Member of that of London, has traced the framework of a new map of the northern part of this little-known continent, taking for his base line, or point of departure, the recent surveys of the coast by Capt. W.H. Smyth, R.N., Tofiño, MM. Bérard and Dortet de Tessan, Boteler and Borda.* He has laid down afresh the various itineraries furnished by different travellers, which may thus be classed:—1st, Routes travelled and surveyed by Europeans; 2ndly, The Roman roads, the measure of which has been transmitted to us by the Itinerary of Antoninus and the Table of Peutinger. 3rdly, Routes obtained from natives from the number

* It is to be regretted that the author had not the recent survey of the West Coast of Africa, from Cape Spartel to Cape Bojador, by Lieutenant Arlett, R.N., executed during the spring and summer of 1835.

of hours of march. 4thly, Those measured only by days' journeys. 5thly, Indications of distances and bearings furnished by Arabic writers. Of these, the first class is evidently the most to be relied upon; and M. D'Avezac does our countryman, Shaw, the justice to place him at the head of the list. All the learned traveller's routes are discussed and compared with the Arabic and Spanish writers—as Ibnu Batúta, Ibnu Khaldûn, Edrysy, the Author of the Cartás, Leo Africanus, Marmol, &c., with an Itinerary furnished by Ebn-el-Dyn, translated by Mr. Hodgson, Consul from the United States at Algiers, and published by the "Oriental Translation Committee" of London in 1831; and also the travels of Sir Grenville Temple in the Beylik of Tunis (a valuable addition to our geography of that part of Africa, and not sufficiently known), combined with various itineraries furnished by natives of different parts of the country. Besides these sources, M. D'Avezac has also consulted the works of those eminent geographers, D'Anville and Rennel; modern writers on this subject, as M. Walckenaer, M. Dureau de la Malle, &c.; and has procured itineraries from his correspondents, M. Gräberg de Hemsö, M. de la Porte, and officers employed in Africa; in short, from all available sources; and by the help of which he has reconciled many apparent difficulties—demonstrated the identity of the river of Tafilet and the Zyz, as had been before shown by M. Walckenaer *—and corrected many errors and discrepancies. We are far from meaning to say that many do not yet exist: no one better than the author of the "Etudes" knows that many inaccuracies in the interior still do and must exist, till Africa can be visited with greater security than there seems any probability of at present; but, as M. D'Avezac justly observes, the present outline is an approximation starting from known points;—and the sources consulted having been always the best that were accessible, it must be considered an important addition in critical geography to our information of the northern part of the continent of Africa.†

* Recherches Géographiques sur l'Interieur de l'Afrique Septentionale.

† It may be permitted in a note, perhaps, to notice that the author has been rather severe in his remarks upon one of the last published, and, at the time of publication, certainly the best, map of Marocco—that by M. Gräberg de Hemsö, of Florence. In it there are doubtless some inaccuracies in names, and perhaps a river that may not exist on the southern slope of the Atlas (the existence or non-existence of which might be a disputed point); but should not the critic be on his guard against much greater inaccuracies in his own map, where the Wad Sús falls into the Atlantic forty-five miles in latitude out of its true position; the town of Noun is placed on a river from which it is distant sixteen miles; and the rivers Messa, Shleema (four miles south of Cape Noun), and Draha, to the south of Atlas, do not appear at all.—Ed.

VI.—*Reise um die Erde, durch Nord-Asien und die beiden Oceane, in den Jahren* 1828, 1829, *und* 1830. Von Adolph Erman. Berlin, 1833 & 1835. (*Travels round the World, through Northern Asia and both Oceans, in the Years* 1828, 29, *and* 30. By Adolph Erman. Berlin. First Part, in 2 vols. 8vo.)

Such is the title of a work lately published at Berlin, giving an account of a journey round the world, chiefly devoted to magnetic and meteorological observations, made partly in company with the well-known Professor Hansteen of Christiania: and during which Mr. Erman has had the opportunity of observing terrestrial magnetism with the same instruments, and by like methods, from Berlin to the mouth of the Obi; thence to the sea of Okhotzk; and from Kamtshatka, round Cape Horn, to Europe.

In a brief analysis we desire to point attention to a very valuable work; reserving for some future occasion longer extracts from the account of some almost unknown countries.

Quitting St. Petersburg, Mr. Erman went to Moskow, Kasan, and Perm, crossed the Ural Mountains to Tobolsk, and along the Obi to Obdorsk, situate near the arctic circle, at a small distance from the river. Having returned to Tobolsk he proceeded to Irkutzk, and visited from that place Kiakhta and the country south of the Baikal Lake. Then he went from Irkutzk to Yakuzk, and crossing the Aldan Mountains to Okhotzk. From the last named place he passed to Kamtshatka, and thence to New Archangesk, in the island of Sitkha, and returned to Europe by way of Cape Horn; touching in this passage only at San Francisco in California, at the island of Otaheite and Rio Janeiro. The two published volumes contain only his journey to Tobolsk, and hence to Obdorsk, with his astronomical and magnetic observations.

The object which Professor Hansteen and our traveller had in view obliged them to make exact observations on the geographical position of places, and their elevation above the level of the sea; and in this respect they have considerably enlarged our knowledge of these countries. As far as Tobolsk the geographical position of the places was found sufficiently exact, as they are laid down in the maps of the Russian governments, published in 1826 by Piadishef. But they are much less so along the banks of the Obi, where to the position of the maps the following corrections are to be made:—

Denjikowo	in lat. —0° 2′	in long. —0° 17′
Yelisárowo	—0 4	—0 16
Shorkal	+0 25	—2 25
Beresow	0 0	—2 13
Obdorsk	—0 7	—3 27

Professor Hansteen, who alone descended the River Yenesei to

the Icy Sea, found likewise that the places towards the mouth of the river were laid down about three degrees too far east. But Mr. Erman has not given the detail of his observations.

Between Yakuzk and Okhotzk he again found considerable differences between his observations and the maps. The following corrections are necessary:—

Yakuzk . .	in lat.	+0° 1′	in long.	+0° 5′
Porotowsk . .		+0 12	. .	−0 14
Lebeghine . .		+0 51	. .	+0 2
Nokhinsk . .		+0 49	. .	−0 38
Aldanskū Perewos } . .		+0 51	. .	−0 34
Tshernolyes . .		+0 28	. .	−1 27
Okhozk . . .		+0 1	. .	−0 18

Still greater are the differences between his observations and the maps in the peninsula of Kamtshatka.

The mouth of Tigil River	in lat.	−0° 11′	in long.	+1° 51′
The village Tigisk . .		−0 3	. .	+1 40
Yelowka		−0 8	. .	−0 48
Kliutshewk		−0 12	. .	−1 48
Petropauls harbour . .		−0 1	. .	−0 18

By these observations of Mr. Erman the form of the peninsula of Kamtshatka must greatly be changed on our maps.

Mr. Erman further observes, that the places lying on the road between Petersburg and Yakuzk are laid down with some degree of accuracy, there occurring rarely errors of thirty minutes of longitude.

Not less important are his observations on the elevation of a great number of places through which he passed in Russia and Siberia; they are the more valuable as our author has taken great pains to compare his barometrical observations with others which have been made at Danzig and Mitau for a long series of years.

In passing from Petersburg to Moskwa he found Pomoranya 32 feet above the sea, and Nowgorod Welikii 64 feet. Then he crossed the high ground which divides the waters running in opposite direction to the Baltic and Caspian seas, and found the town of Waldai 867 feet, and Chatilowo 745 feet above the level of the sea. At Wuidropusk the ground had lowered to 597 feet, but it rose again; Torjok, on the river Twerza, having an elevation of 661 feet. The town of Moskwa he found not more than 415 feet above the sea.

Mr. Erman took great pains to ascertain the elevation of the town of Kasan and that of the mouth of the River Kasanka, and in this task he was much aided by different series of barometrical observations, which had been made at the University of Kasan.

The elevation of the town he found to be 104.8 feet, and that of the mouth of the Kasanka only 28.9 feet above the sea. This determination is of great importance, as it has some reference to the depression of the Caspian Sea below the level of the ocean. We translate the passage literally.

"It is hardly necessary to mention that in this manner is also obtained, by means of the result just spoken of, the solution of a noted question,—viz., the level of the Caspian Sea; for in measuring the course of the river Twerza and of the Upper Wolga, we find from Torjok to the mouth of the Kasanka about 155 German miles,* whilst the Wolga, from this last point to the Caspian below Astrakhan, traverses a space of 205 German miles. Now our observations give us for the first 155 miles an inclination of 98.5 toises, or 630 feet English; and for the other 205 miles a descent of 4.5† toises + x, if by x we designate the difference of level of the Caspian below the ocean; supposing that at an equal elevation the pressure of the air is the same on the Baltic as at Kasan.

"It hence results that, however great we suppose the gradual diminution of the inclination from the Twerza to the mouth of the Wolga, we shall have with little doubt a positive value for x. If, for example, we were to suppose the inclination from Torjok to Astrakhan diminishes uniformly, and that at Astrakhan it is equal to zero, we shall find that the difference of level of the Caspian below the ocean is 42.8 toises, or 274 feet English; and at the same time the inclination of the Twerza at Torjok gives 0.810 of a toise, and that of the Wolga at Kasan 0.416 of a toise, for each German mile."—Vide p. 359.

From Kasan Mr. Erman travelled to Perm in a north-eastern direction. After passing the river Wiatka at Malmuish (135 feet), he entered a much more elevated country between the rivers Wiatka and Kama, Milet being 321, Arporetch 514, Mukikaksi 539, Kojil and Uri 886, and Suri 912 English feet above the sea. The high hills, over which the road leads, between Suri and Debjosui, rise to 1085 feet, and the latter place is still 957 feet above the sea-level. Here Mr. Erman came nearest the line of separation between the waters running into the Caspian and White Sea, and it may therefore be supposed that the high land separating the upper branches of the Kama and Wuitshegda rises at least to 1500 feet. From Debjosui he descended gradually into the vale of the Kama to Perm, which is elevated 372 feet.

From Perm he went to Yekatarinburg, across the Uralian Mountains. Kungur on the Suilva is only 488 feet high, and may be considered as placed at the base of the Ural, for at a short distance

* One German mile is equal to four and a half English miles nearly.

† There is manifestly some difficulty here; 55.7 toises would seem to be the descent: it may be a misprint, or we may have mistaken the passage. It will be found at p. 359.—Ed.

from it is Morgunowo, at 937 feet high. Though the ground farther east is extremely uneven it does not suddenly rise, the village Bisersk having an elevation only of 931 feet. Between this village and that of Klenowsk occurs the first ridge of the Uralian Mountains, the heights rising to 1541 feet. The village of Klenowsk, between the first and second ridge, is at 1008 feet. The second ridge, which is the widest, rises to 1701 feet in the mountain-pass, between the villages Bilimbaiewsk and Reshótin. At the base of this ridge is built the town of Yekatarinburg, 976 feet above the sea.

Travelling along the base of the eastern declivity of the Uralian Mountains, on a road which did not rise above 1200 feet, nor sink lower than 900 feet, Mr. Erman measured Mount Blagodat, consisting entirely of magnetic iron-ore, and lying near the village of Kuschiva, 58° 17′ N. lat. He found its summit 1534 feet above the sea. Farther to the north, and nearly in the parallel of Werkhoturie, is Mount Katshkanar, which rises to 2960 feet. To about the same height rises Mount Kanjakowo, nearly 60° N. lat., and the two high summits of the Uralian Mountains near 55° N. lat. called Mount Kossolur and Taganai, do not appear to exceed it. The highest portion of the range seems to be beyond the polar circle, between 66° 49′ and 67° 13′, where Mr. Erman determined the elevation of five mountains, the most northern and highest rising to 4908 feet, the second to 3993, the third to 2407, the fourth to 2240, and the fifth only to 1290 feet. These mountains lie north of Obdorsk, and are, therefore, called by him the Obdorskian Mountains.

The lower portion of the town of Tobolsk was found to be only 128, and the upper 357 feet above the level of the Icy Sea.

From Irkuzk, which is 1246 feet above the sea, Mr. Erman went to Kiachta, but the elevation of the latter town he did not determine by his own observations. He used for that purpose those made by the Academicians in the time of Catherine II., viz., 2228 feet above the sea.

Very numerous are the observations made by Mr. Erman on the road between Irkuzk and Yakuzk, and others were made a few days afterwards by Lieut. Due, the companion of Professor Hansteen. Our author compared them with great care, especially those made on the tract of land which contains the sources of the Lena river, because this country has always attracted the attention of the geographers, on account of the peculiarities of its surface. Though the country between Irkuzk and Tiumenowsk on the Lena is extremely uneven, it is not mountainous, but a considerable rising is perceptible from the town of Irkuzk to the village of Kátshuga, where the rivulets have their sources which form the upper branch of the Lena. The lowest point he found at the

village of Khumutowsk, at some distance from Irkuzk, which was only 1117 feet high, but a hill near it rose to 1461 feet. At the village of Olsonsk the ground had risen to 1692 feet, and at Baghendaisk even to 1771 feet. This was the highest point of the road. Khogotsk was 1618; Mansursk 1611, and Kátshuga only 1509 feet high. As Mr. Erman proceeded down the river Lena on the ice, the observations which he made may be considered as indicating the fall of that great river. At Botowsk he found the surface of its ice still 1044 feet, at Parshink 621 feet, at Nelinsk 432 feet, at Olehma 411 feet, and at Yakuzk only 287 feet above the level of the Icy Sea. For it is here to be observed that Mr. Erman came to these conclusions by comparing his observations and those of Lieut. Due with the mean elevation of the barometer at Ustyansk, on the shores of the Icy Sea at the mouth of the Yana river, which was found by Capt. Wrangel 337‴ 78 of the French foot.

From Yakuzk to Okhozk Mr. Erman passed the range of the Aldan mountains. He encountered here a difficulty in making his observations; for there exists a difference in the pressure of the air column at equal levels on the banks of the Lena, and on the shores of the sea of Okhozk. In reducing the barometrical observations at both places to the level of the sea, he found the elevation of the column of mercury at Yakuzk 337‴91, and at Okhozk 331‴31. He says that this strange difference has already been observed by other natural philosophers, and that it exists also in Kamtshatka. In order therefore to give his barometical observations the greatest possible exactness, in order to measure the elevation of the ground, he has supposed that the pressure of the air continually decreases in proceeding from Yakuzk to Okhozk, though he thinks it probable that the highest part of the Aldan mountains may form a kind of boundary line.

The country lying along the road leading from Yakuzk to Okhozk may be divided into two portions; that which lies to the west of the Aldan river, a tributary of the Lena, rises continually, but gradually, as it proceeds to the east. At Tshasinghisk, several miles east of Yakuzk it attains only 347 feet; at Montjega, somewhat more than half-way between the Lena and Aldan, 642 feet; and at Nokhinsk, on the heights forming the western banks of the Aldan river, 751 feet. The depressions between these hills are flat, and descend rarely a hundred feet under the mean level. Aldanskii Perewos, in the valley of the river Aldan, is 424 feet above the sea.

On the eastern banks of the Aldan river, the mountain-range, which has derived its name from the stream, rises with a steep ascent. Bielskii Perewos, situate on a small tributary of the Aldan, lies 764 feet high; and east of it are two mountains, the

western rising to 970 feet, and the eastern to 1502 feet. Garnastakh, a solitary abode of a Tunguse family, lies in the middle of the range, 1531 feet above the level of the sea, on a rivulet. It is everywhere inclosed with high and steep mountains. of which that to the south, called by the natives Ulagtshan, is the highest. Its summit attains 2722 feet above the level of the sea. Dense forests ascend on its sides to 2252 feet, but single larch trees as far as 2504 feet. Between Garnastakh and Allukhiuna, which lies in a longitudinal valley on the bank of a river bearing the same name, is situated that part of the Aldan mountains which is called Sem Khrebti, or the Seven Backs, and which rises above the boundary of the larch-trees (*Pinus larix*). Its mean elevation is between 2400 and 2600 feet. But the mountains between Allakhiuna and the sea-coast are still higher. The mountain-pass, about six miles west from Khoinia is 2619 feet high; Khoima itself, 2247; and Mount Kapitan, the highest point of the Aldan mountains in this part, rises to 4055 feet. On the east of Mount Kapitan the country continues to be from 2400 to 2600 above the level of the sea, and only to the east of Ketanda, in 60° 40′ N. lat. and 141° 38′ E. long. of Greenwich, it descends with a rather steep declivity. Okhozk is only thirteen feet above the sea.

Mr. Erman made a great number of barometrical observations on the mountains in the interior of the peninsula of Kamtshatka: and that he might be enabled to determine the elevation of the mountains exactly, he caused corresponding sets of observations to be made at Tigilsk, near the mouth of the Tigil river, on the western coast of the peninsula; and at Peter Paul's Harbour, on its eastern shores. Here, too, he observed the difference in the pressure of the air at the same level. The mean elevation of the barometer at Tigilsk (in lat. 58°) was 331‴99, and at Peter Paul's Harbour (in lat. 53°) 334″06; so that at a distance of five degree of lat. there existed an apparent difference in the level of the sea, amounting to 24·83 toises, or 159 feet.

The travels of Mr. Erman in Kamtshatka were limited to the country between the mouth of the Tighil river (in lat. 58° 1½′), and Peter Paul's Harbour (in lat. 53° 0′ N), and especially directed to the examination of the volcanoes, which occupy in this part the interior of the peninsula. He visited first the volcano of Shivélutsh, which rises with two peaks; the north-western (in lat. 56° 40′ N. and in long. 160° 12′ 52″) attains an elevation of 8716 feet; and the south-eastern (in lat. 56° 40′ 32″, and in long. 160° 15″ E.) 10,591 feet above the sea. Trees were found to ascend its sides to 2837 feet. He then examined the great volcano of Kliutshewsk, whose summit he found to attain 15,825 feet above the level of the sea. A current of lava of recent date de-

scended on its sides to 8558 feet above the sea; the *salix arctica* was frequent at 5322 feet, and mountain-asp was found as high as 3094 feet. He determines the geographical position of the summit to be in lat. 56° 4′, and long. 160° 52′ E. The third volcano visited by Mr. Erman was Tólbátshinsk, which rises only to 8346 feet.

The personal narrative of this journey is filled with geographical detail on the country between Berlin and St. Petersburg, and thence to Tobolsk, as also from Tobolsk to the mouth of the river Obi. Though these details are sometimes very minute, they are far from being divested of interest. We omit them, and, more reluctantly, his observations on the water-communication existing in the interior of Russia—on the mines of the Uralian mountains, and the hydrography of the river Wolga and its affluents. Still more we regret that we have not space or leisure to insert a translation of the accounts he obtained at Tobolsk, respecting the country which is known under the name of the Steppe of the Khirghis, and through which, as it appears, there exists a regular commercial intercourse between Tobolsk and the town of Tashkend in the khanat of Khokan. As this country is nearly unknown to geographers, we desire to direct attention to the valuable information contained in these volumes.

MISCELLANEOUS.

I.—*Report of the Expedition for exploring Central Africa, under the superintendence of Dr. A. Smith.* (Abridged.)

It is generally known that, in 1834, an association was formed at the Cape of Good Hope for the purpose of exploring Central Africa; by whose direction was organized an expedition placed under the immediate superintendence of Dr. Andrew Smith, well-known as an able naturalist, who was accompanied by several volunteers, zealous in the cause of discovery. The expedition, which was on a large scale, consisting, it is said, of about fifty persons, one hundred and fifty head of cattle and horses, and, perhaps, twenty waggons, started from Graaf Reinet on the 12th August, 1834, and returned in the beginning of the present year. Immediately on its arrival a report of its proceedings was laid before the Association; and as the results, in a geographical point of view, are valuable, and likely to lead the way to yet farther discoveries, we consider it of sufficient importance to give an abridgment of the whole report.

Leaving Graaf Reinet, the party travelled, by moderate stages, till they reached the Nu Gariep, or Black River, the southern branch of the Orange River, and thence to Philippolis, a missionary station, about twenty miles beyond it: here they found that, owing to the excessive drought, it would be difficult to procure cattle fit for draught, or to find subsistence for them in crossing the dried-up plains towards Lattakoo. Dr. Smith decided, therefore, to proceed to the eastward, and examined the undescribed tribes and country towards the sources of the Caledon River. He proceeds:—

"On the 10th September we left Philippolis, and four days moderate travelling brought us to Verhuil, a French missionary station. The population here consists of 6000 persons, chiefly driven away from their native country by wars or by want. On the 23rd we continued our journey and reached the Caledon River. Where we first saw it, which was several miles above its confluence with the Nu Gariep, or Black River, it was a stream of considerable size, little inferior as to the quantity of water it contained to the Black River itself. Our course from thence was nearly parallel with it, though generally at a considerable distance either on the one side or the other. In proportion as we receded from Philippolis, in the same proportion did vegetation improve, and by the time we arrived towards the higher parts of this river every plain was found to be covered with a conti-

nuous sward of most luxuriant grass, which continued to the very limit of our journey in that direction. Water was also found in much greater abundance, and the number of small limpid streams which occurred gave an agreeable and interesting character to the country, as well as a degree of comfort, which we had not experienced since leaving Graaf Reinet.

"Previous to arriving at the French missionary station, Moriah, we passed to the north of the Kous Mountains, which form a part of the high belt that divides Cafferland from the Bechuana country.

"On approaching the territory of the Bashootoo, the character of the country began to change, the low primitive hills which in the district of Philippolis were only in a very few instances found to be surmounted by a capping of sandstone, rose to a greater height, and were almost invariably so covered. The surface of the flats, which in the former district either consisted of a firm ferruginous clay or of the bare primitive rock, was here either a mixture of vegetable mould and ferruginous clay, or of a silicious or a coarse-grained sandstone. Small trees and brushwood, neither of which had been seen in any quantity since leaving Graaf Reinet, began to clothe the ravines and breaks in the hills; whilst Proteas and a variety of other dwarf trees skirted the bases of some of the more considerable ones, and reminded me strongly of the country about Platte-kloof, in the district of Swellendam. Near this spot we ascended one of the highest hills in the district, and obtained a distant view of the high mountain range already mentioned, when speaking of the Kous Berg, and which is known to the colonist by the name of "Witte Bergen." Travelling, which to this point had been attended with but few difficulties, as far as regarded the road, now became irksome, in consequence of the rugged and broken nature of the sandstone over which we had frequently to pass; we could no longer, as formerly, proceed from point to point almost in direct lines, precipices and broken ground stood between us and our object nearly in every direction, and rendered our path so intricate, that neither by the direction we had received from the natives, nor by the assistance of our interpreter, who had formerly visited Moriah, could we ascertain its position, till after halting and sending out men to examine the country. By that means it was discovered that the site of the Mission was at no great distance, and that by immediately proceeding we would reach it before dark the same day, viz., the 12th of October. There we found a large substantial stone house, and the Rev. Mr. Cassilis, the only white inhabitant of the place, ready and delighted to receive us.

"From him we learned that the abode of the principal chief of the tribe was at some considerable distance to the eastward, but that his son was present on the station, and that he had despatched a messenger to inform his father of our approach, so that we might expect a visit from him in a few days. The situation of Moriah is very picturesque, and its inhabitants, as well as those in other parts of the country, observe considerable caution in guarding against attacks from enemies. They had all placed themselves in situations where they

could not be assailed on all sides, and where an assault from any quarter could not be effected without considerable inconvenience and exertion. To such precautionary measures they have been driven, from having so long been subjected to the ravages of the tribes which have been expelled from their native country by the successful arms of Chaka. The people resident at this station may amount to about 300, and are all under the immediate government of the oldest son of Moshesh, the present king of the tribe. On the afternoon of the 14th, the latter arrived on horseback, accompanied by several mounted attendants, and on approaching our camp all, excepting himself, dismounted and fired a salute. He then advanced towards our tents, where he alighted with ease and freedom, offered his hand, and in other ways evinced indications of friendship and marks of great delight. A very trifling degree of physiognomic knowledge was required to generate the most favourable impressions as to this individual, and all of his proceedings whilst we were in his country went to justify the high opinion formed of him at first sight. The candour he evinced, and the freedom with which he talked of the early and present history of his tribe, particularly of its manners, customs, superstitions, &c., proved sufficiently that he had either never suffered under the same mental degradation as the majority of savage rulers, or that he had made a considerable advance in knowledge, and got rid of many of the vile trammels which corrupt the ideas and vitiate the imagination.

"Here I met with the first instance that has ever occurred to me of the principal chief of a clan condescending to furnish information on every subject desired. Persons of the rank in question are generally ready and willing to state their complaints and grievances, but to touch upon any thing beyond those will be found sufficient to drive them from your society. Moshesh stated that the Bashootoo were originally Baquaina, and that they left the country of their forefathers in consequence of oppression and poverty. Their present country is the third which they have occupied since they became emigrants: in their first movement, they approached the Ky Gariep, or Likwa; in their second, they proceeded towards the sources of the Caledon; and in the third, to which they were compelled, by their inability to compete with the successive attacks of the Amahlobi, Amanguan, and Balkokwa, they arrived at their present residence. Their language is the Sichuana, with a few trifling variations—the origin or import of the national name could not be discovered.

"The necessary acknowledgments having been made for the obligations here conferred on us, we proceeded on the 25th of October in the direction of Lishuani, a Wesleyan establishment under the superintendence of the Rev. Mr. Edwards, and reached it on the 29th. There we found the principal remnant of the Griquas, who formerly acknowledged Barend Barends as their chief, now under the rule of Peter David.

"From Lishuani we proceeded on the 4th of November in an easterly direction; and on the 6th arrived at another Wesleyan sta-

tion, under the care of the Rev. Mr. Jenkins. The inhabitants of this establishment belonged to the tribe of Ky Kora, or Great Corannas, who had lately removed thither from the Hart River, in search of a better dwelling-place.

"From Umpakwani Messrs. Archbell and Alison accompanied us to the Mantatees, and about ten in the evening of the 7th November the waggons arrived under the hill where the principal chief of the tribe was residing. Those two gentlemen, together with myself, rode on in advance of the waggons, and took up our position at a small house which had been built for the abode of Mr. Alison. From thence we despatched a message to Ciconiæli, requesting an interview, and an answer was received some hours afterwards, to the effect that he would shortly be with us. When he arrived I found his appearance calculated to excite unfavourable impressions, in the same degree at least as that of Moshesh was to produce the opposite. He expressed satisfaction with our visit, but an evident suspicion lurked within him, as was naturally to be expected, since he was doubtless conscious of the estimation in which he was held, and of the crooked policy which he was notorious for practising.

"On adverting to the history of his tribe, he betrayed the reluctance already remarked as characteristic of the majority of savage chiefs; what information he furnished was actually wrung from him, and he took the first opportunity of avoiding the inquiry. His mother, on the other hand, resembled Moshesh, and it was from her principally that we obtained the knowledge we possess of the nation.

"Whilst residing on the Namahari River it was known by the name of Baklokwa, or Bakora; but on flying from thence and coming in contact with the Bashootoo and other Bechuanas, when it was under the government of Mantatee, they characterized the tribe by the name of its leader, and ever since it has been better known by the term of Mantatees than by the one it originally possessed.

"The descent of the Baklokwa could not be traced, owing in some measure to their ignorance of its ancient history, but principally, I am inclined to believe, to their pride. A mere allusion to the probability of their being a portion of an older community, was opposed with all their energies, and invariably led to the assertion, that they were from the beginning as they now are, unconnected with any other people. The entire of the country towards the sources of the Ky Gariep or Vaal River, was some time ago inhabited by tribes resembling them in manner, customs, &c.; but they would not admit their derivation from any of them, nor did they demand for themselves the honour of having given birth to any separate community. Their dress and war implements are the same as those which were in use among the tribes more to the eastward.

"The Baklokwa, like the Bashootoo, principally reside upon the tops of the hills, and the one upon which we found Ciconiæli was better adapted for defence than any we had previously seen. It could be readily ascended only by one narrow foot-path, which, towards the top, passed between perpendicular rocks only a few feet apart. There

they have a wicket door of great thickness, and over it the space between the rocks, to a considerable height, is closed by a wall of stones.

"On the 8th we proceeded to the eastward, in order to ascertain the sources of the Caledon, which were represented as being about fifty or sixty miles distant in the high mountain range, which now lay about thirty miles to the southward of us. On approaching it we found the information we had received to be correct, and that it issued from the mountains by two principal branches.* It was during this part of the journey that the accident occurred to Captain Edie, which eventually deprived the expedition of his services. From the sources of this river we found it impracticable to proceed farther in an easterly direction, without first returning nearly to the residence of Ciconiæli; and even after that we could only have travelled north-east, in consequence of the course of the mountains, which would have carried us directly to the spot where Peter David, only a few weeks before, lost his waggons. Though there appeared no actual reason for our contemplating a like misfortune, yet a probability existed that some unpleasant collision might unavoidably happen, which would at least have the effect of seriously impeding our future operations. Umsiligas, it was known, had declared that he only regarded those persons as his friends who approached him from the direction of Kuruman; and as it was desirable that we should not appear enemies, our duty was self-evident. As soon, therefore, as Captain Edie was in a state to travel, we moved in a south-west direction towards the range already mentioned, and on reaching it ascended one of its highest peaks, from whence we enjoyed an extensive view towards the north, but a limited one to the other quarters, arising from our position being upon the northern limit of a belt of broken porphyritic mountains, at least thirty miles in breadth, and in which are situated the sources of the Nu Gariep, or Black River. Our movements in this district were greatly retarded by the heavy falls of rain that almost daily occurred, and which more than once flooded the rivers.

"On the 24th November we re-crossed the Caledon nearly opposite to Lishuani, and from thence directed our course towards Thaba Unchu, a large Bechuana station, where the remnants of various disorganized tribes had been collected by the Rev. Mr. Archbell. The principal chief was a Baralong, and the greater number of the inhabitants were also of that nation. At a little distance from this establishment a considerable body of Corannas reside, under a chief of their own, who, to secure the friendship and countenance of the Missionary, has appointed one of his most prudent and influential men to live near to him. To the north and north-east of this station we

* As far as we can trace Dr. Smith's route on our maps, these sources of the Caledon must be in about 29° 50′ S. lat., and long. 29° E.—or 100 miles due west of Port Natal. If so, Captain Allan Gardiner, R N., in his late journey from the eastern coast, must have reached within about ten miles of the route of Dr. Smith's party,—viz., the eastern part of the Quathlamba range, from eighty to one hundred miles west of Port Natal.—Ed.

found the remnants of the Lihoyâ, a tribe which some considerable time ago emigrated from the north of the Vaal River. They are of the Bechuana family, and since the death of their principal chief one portion has become tributary to Ciconieli, and the other to Moshesh. After acquiring considerable information at Thaba Unchu, relative to the Baralong and the tribes which formerly occupied the country towards the sources of the Likwa, or Vaal River, particularly those of the latter, which approached Latakoo in 1823, and were defeated by the Griquas, we left it on the 4th of December, and directed our course towards Philippolis. During this stage we crossed the Vaal, Modder, the Black Modder, and the Riet Rivers, and came in contact with several hordes of Corannas, all of whom seemed ready and willing to supply information, and were zealous beyond measure in recommending themselves and criminating their neighbours. Over the more sterile parts of this district are dispersed a number of petty lawless hordes, each under some notorious robber; and it is by their proceedings principally that the peace beyond our northern frontier is so constantly disturbed. One of the most prudent and courageous of these, Jan Bloom, is an illegitimate son of a late colonial farmer, who will long be remembered by the Bechuana, in consequence of the serious evils they experienced at his hands, even whilst he was a subject of the Cape government. On arrival at Philippolis our prospects appeared favourable, rains had fallen in abundance towards Latakoo, the oxen left in charge of Mr. Kolbe were in good condition, and nothing operated to prevent our immediate advance except some repairs which were required for the waggons. These were completed with as much expedition as possible, so that by the 26th of December we were on the road to the Vaal River, which we reached on the 6th of January, 1835, and, to our great mortification, found it flooded, and likely to be impassable for many days. Thus far a number of Griquas belonging to Philippolis accompanied us, and amongst others the late worthy old chief Dam Kok, who, out of anxiety to forward our views, remained till the 14th, and only then left under an idea that a considerable delay would yet be unavoidable. On the 16th a report was brought that the river was again upon the rise, which induced me immediately to determine by actual experiment whether or not it could be crossed; with that view a waggon was emptied without delay, sent in and conveyed to the opposite side without accident or serious difficulty, though the water reached fully half-way up its sides. The result encouraged to further attempts; the stores, &c., were raised to a height beyond the reach of the water, and though one waggon was overturned, yet we succeeded in getting all over before dusk, and placed in a position where we felt no further anxiety about the state of the river.

"From this point Latakoo was to be reached by one of two routes, and as it was probable that the western one would necessarily be that which we should have to travel on our return to the colony, the eastern one was now preferred. Our course for some days was close to the river, and in that time we came in communication with Motibe

the proper chief of Latakoo, who, with a party of his subjects, had removed here some years ago, to escape the attacks of the Corannas and Griquas, which had proved so harassing to them in their native country. A considerable number of inhabitants were dispersed around his residence, all of whom, owing principally to the barrenness of the country, were miserably poor. Notwithstanding such was their condition, it was pleasing to observe that the seeds of civilization which had been sown amongst them at Kuruman were still in activity. The thirst for instruction manifested by the younger classes exceeded any thing I had yet witnessed, and the number of young men which were neatly clothed in jackets, &c., principally of leather, was strikingly great in proportion to the population. They refused to trade with us for any article which was simply ornamental, and inquired after nothing but what was calculated for purposes of clothing. The chief himself is in his dotage, filthy and indolent to an extreme, and apparently indifferent either to his own situation or that of his people.

"After leaving Motibe, we travelled in an easterly direction to the spot where the Hart River terminates in the Ligua*; and from thence our course was along the banks of the former, until we arrived at the road which leads to Bootschap, the late station of the Griquas now resident at Lishuani. Here we left the river, and took the direct road to Latakoo, which now bore from us to the west of north. For the first two days the country kept gradually rising, but afterwards continued nearly of the same level till we reached Kuruman; and wherever rocks appeared, they were found to consist of a fine crystallized, bluish-white limestone. The greater part of the country in question is covered with a dense brushwood, and has from time immemorial been one of the favourite haunts of the Bushmen. In former days, water existed throughout this district in tolerable abundance; but at present the number of springs is comparatively small, and even those, according to the statements of the natives, are diminishing in strength, and they are thus brought to anticipate the period as not far distant when necessity will force them to seek another abode.

"On the 30th January we reached Kuruman, and were met at some little distance from the station by the Rev. Mr. Hamilton, who informed us of the serious indisposition of the Rev. Mr. Moffat, and of his great anxiety to see me. On visiting him, which was done without delay, I found him suffering from a severe bilious attack, which appeared to have been occasioned by over exertion in the printing-office. In spite of the sickness, he, with a zeal characteristic of his character, immediately entered into our views, and furnished a detailed account of the misfortunes which had befallen Mr. Bain and his attendants. He appeared to anticipate little danger from our visiting Umsiligas, and declared himself ready and willing to accompany us, should he recover before we started. Upon mentioning to him the circumstances under which the soldiers had been granted, and the nature of our general instructions, he united with me in regard-

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* Likwa, or Vaal River, probably, of our maps.—Ed.

ing it desirable to open at once a communication with the Matabili, which would enable us to judge of their feelings, and discover if that part of the interior could be visited without a probability of secret opposition or open violence. To accomplish this, two messengers were immediately engaged, and despatched to Mosiga, with strict injunctions to proceed with all possible haste, and return without delay.

"Shortly after our arrival at Kuruman, our oxen began to suffer from a disease which the natives call *quatsi*, and before we were able to attempt a removal from thence, nearly twenty had died. The complaint, it was stated, occurs almost every year in this district, and its attacks are extended to man as well as to the lower animals. On the appearance of the complaint amongst the cattle, blood-letting is usually resorted to by the more intelligent of the natives; and the propriety of the practice was evident, from the inflammatory character of the symptoms.

"This unexpected sickness delayed our advance towards the country to the westward, which was meditated on the departure of the messenger, and did not permit us to move till the 25th of the month. On that day we set out, with four waggons and the best of our oxen, and on the 28th, after having passed some large kraals of Batlapi, Baralong, and Batlaroo, we reached Tsining. From this place, a range of high hills was observed to the westward; and as it was desirable to visit it, the arrangements rendered necessary by the scarcity of water were made, and a party, consisting of ten persons, started on the 2nd of February. After three days' travelling, during which both men and oxen suffered severely from thirst, we arrived at a small pond immediately at the base of the mountains, early on the morning of the 4th, and in the afternoon of the same day ascended one of the highest peaks, whence we enjoyed an extensive view towards the north, north-west, and west. The southern extremity of the Kalahari desert was from that distinctly seen, and appeared almost a perfect flat, densely covered with brushwood, through the foliage of which plots of a yellowish-white sand could here and there be clearly observed. On returning to the waggon, some natives belonging to the Batlaroo tribe were discovered, who stated that they had only a few days before left the desert, owing to the total want of water, and that they would be under the necessity of remaining here till rains should fall, though, by doing so, they would in all probability lose what little property they possessed, it being a custom amongst the more wealthy of the tribe to attack and plunder the wandering poor wherever they find them. The return journey was attended even with more inconvenience than the outward one; what little water was left on the latter had nearly disappeared, and only in one situation was the quantity found sufficient for our wants. In the neighbourhood of that pool were congregated a number of Bechuana, and it was really painful to observe the horror they manifested on seeing our oxen make such free use of its contents; they declared that upon it their existence depended, and should it be consumed, many of them must inevitably die from thirst. The determination of these people showed

most wonderfully the power of habit: almost all of them were in a state of starvation, and entirely depending upon chance for the means of support; yet they preferred such uncertainty, to becoming the slaves or servants of the more wealthy members of the nation who were resident at the Upper and Lower Kuruman. They urged, in answer to my importunities, directed to induce them to alter their manner of living, that they had from childhood been accustomed to it, and therefore could not abandon it for one which I might conceive would be more comfortable.

"On returning to Tsining, it was determined that we should visit Mirribin and Chue, two places from which the Kalahari have at times been entered. Soon after starting, we came in contact with the sand-flats which form the borders of the desert, and over those we travelled with great difficulty, till we reached the former station. The sand extended everywhere to a great depth, and bore upon its surface a scanty covering of brushwood and dwarf mimosas. Before reaching Mirribin, both men and oxen were completely exhausted from want of water: the latter, in addition to the necessary halts, had passed twenty-three hours actually in the yokes without ever having had an opportunity of satiating thirst, or more than simply moderating hunger. Under the circumstances, it was interesting to observe the mixture of beings which were, almost in a moment, vigorously engaged in drinking from the same pools,—a mixture which arose from our people being disinclined to protract the terrible sufferings of the oxen.

"Here we found a small community of Baralongs, trusting entirely for support to the spontaneous productions of nature. On questioning them relative to the desert, all unanimously declared that it was utterly impossible at the time to travel in it; and even the offer of a gun, which is of all things the most valued, could not command a guide. All spoke with horror of what they had once experienced in it, and to a man affirmed that they would sooner suffer death than attempt it again. The only point now remaining to be attempted was Chue, which we reached after travelling for seventeen hours without water; and the information we there obtained was equally unsatisfactory.

"Here we ascertained that the country had, within the last five years, been getting gradually drier, and that, at the period when they left it, not a drop of water was anywhere to be found. From the tops of some hills to the north of our encampment, we obtained a view of a considerable tract of this barren waste, which was said to differ in no way from the broad belt beyond it, except in being less densely covered with bush: the sand is continuous, and in places raised into ridges; the bush is low and intertwined; so that travelling in straight lines is impossible; nay, even the erect posture requires occasionally to be exchanged for the knees, in order to avoid the lowermost branches.

"Having completed our inquiries at Chue, and having reason to expect the return of the messengers, we started for the Motito, by way

of the Mashua River; and, after experiencing privations similar to those already mentioned, we found ourselves at the residence of the Rev. Mr. Lemu, on the evening of the 17th of March. The climate of this part of South Africa must, in the course of the last fifty years, have undergone a great change, as, within the memory of persons yet living, sea-cows inhabited the Kuruman River, where it is now without a drop of water, and numerous dry channels exist elsewhere, which once formed the beds of respectable streams.

"On arriving at Motito, we found that the messengers had passed on their way to Kuruman, with a friendly invitation from Umsiligas, and a Litabili guide to conduct us to his country.

"As all our wants had been supplied, we left Kuruman in company with our new guide on the 30th of April, and Motito on the 15th of May.

"Whilst at the latter, awaiting the arrival of Mr. Moffat, Mohura sent an order to our interpreter to return to Kuruman, and a message to me, declaratory of his intention to prevent our proceeding to Umsiligas. The poor man seemed to fear non-compliance with the order of his chief; but on being directed to deliver my answer—namely, that if he (Mohura) was able to effect his purpose by force of arms, he might prevent us, but not otherwise, he seemed more at ease, and decided upon remaining, at least for a time.

"After leaving the neighbourhood of Latakoo we met with few inhabitants till we reached the country of the Matabili, distant about two hundred miles in a north-east direction. In former days this intervening district was inhabited by Batlapi and Baralong; but at present it is only the resort of the poor of those tribes, and of the Baharootzi. It may be said to consist almost of one extensive flat, which, during and for some time after the rainy season, is thickly covered with luxuriant grass; but at other times is barren and, except in a few places, nearly destitute of water. When within a moderate distance of the Molopo, we despatched messengers to inform Umsiligas of our approach, and to state that we should remain at that river, which is considered the western boundary of his territory, until we should receive further information. On the third day after our arrival, and whilst I was absent to examine the source of the river, a chief and three attendants reached our encampment, with a request that we would immediately proceed to Mosiga, where the king would be delighted to receive us. With this invitation we readily complied; and, towards noon of the 2nd of June, descended into a fine valley or basin, bounded on the north and north-east by the Kurrichaine range, and which, previous to its occupancy by the Matabili, formed the principal residence of the Baharootzi tribe. Here, as we had been given to understand, whilst at the Molopo, Umsiligas awaited us; but scarcely had we halted, before it was discovered that he was yet considerably in advance, though in what direction was not to be ascertained. In our way to a convenient halting-place we passed several large kraals, out of which rushed great numbers of men, women, and children, each more anxious than another to see the waggons and the

people. Their near approach, however, was prohibited: strict orders had been given that nobody was to approach the party; so that when any such attempt was made, a word from the chief, or a shower of stones from his attendants, soon placed all spectators at a respectable distance. A similar system, though not always equally rigid, was observed during our residence in the country; and more than once, when I urged our guard to permit individuals to gratify their curiosity, it was stated to be impossible, because the positive orders of Umsiligas were, that we should in no way be incommoded by his 'dogs.' The day after we arrived at Mosega, Kalipi, the chief, who had met us at the Molopo, called at the waggons on his way to the king; and, after being absent two days, returned, bearing the congratulations of his Majesty, and a request that we would, with all possible speed, proceed to his kraal.

"Our road, for the first two days, wound between the ranges of the Kurrichaine hills, and carried us past several kraals, at which were abundance of cattle, but few inhabitants.

"On the night of the 8th of June we halted on the banks of the Marikwa River, a little below where it issues from the mountain chain. From this place it was wished, by Kalipi, that Mr. Moffat should proceed in advance of the waggons, they being not more than sixteen or eighteen miles from the residence of the chief. To this our worthy friend readily consented; and, long before we were prepared to move, he and the Matabili who accompanied him were out of sight. The country passed this day was, in general, closely covered with bush; and at one place the road skirted the remains of a very large Bamaliti kraal, which had, many years ago, been destroyed at the instigation of, and by the personal assistance of, Conrad Buys, a man who, by his abominable and unprincipled conduct, entailed more suffering upon the native tribes of South Africa than can easily be described.

"The first kraal we approached, was stated to be that of which we were in quest, and though it was little calculated to impress us with the idea of its being the royal lodge, yet, the appearance of Mr. Moffat in the distance, soon satisfied us that Umsiligas was there, and a farther proof was immediately given by his own actual appearance in front of the door, ready and anxious to acknowledge us as we passed to a halting-place. Curiosity, as well as etiquette, required that we should not be slow in paying our respects, so the moment the waggons were placed in their proper position, we proceeded to the kraal with Mr. Moffat as lord in waiting. On entering we found Umsiligas seated on one side of the cattle kraal, with our messengers and a number of petty chiefs immediately around him, and at a distance was a guard of about fifty or sixty of his warriors. As we approached he stood up, offered his hand to each in succession, and uttered repeatedly, but indistinctly, *goeden dag*. It having been understood that nothing in the form of seats would be offered us, Mr. Moffat and myself took care to be provided with stools, but the others of the party, who disregarded that precaution, found it necessary to squat

themselves upon the dry cow-dung. For some minutes after the ceremony described, a perfect silence prevailed, during which time the chief was not inactive with his eyes, and whenever they met those of any of the party, he smiled with apparent satisfaction. After this, orders were issued to several individuals present, and almost instantly a portion of the breast of an ox, finely stewed, and contained in a wooden dish, was placed in the middle of the group, and several calabashes well filled with what he called his beer were carried to him, and set at his feet. The interpreter was now desired to request us to eat, an invitation which we did not require to have repeated. To supply knives, not being regarded as a part of *his* duty, Mr. Bell immediately made up the deficiency by producing one, which performed the dissection well, and soon enabled each to fill his hand with a mass of well-cooked meat. After eating was concluded, the chief drank a large cupful of beer himself, and then handed one to each of us, in succession, and had we been as anxious for repetitions of the dose as he was to supply them, some at least would have found difficulty in reaching the waggons.

"During the time we were thus employed, he put a variety of questions both to Mr. Moffat and myself, more especially as to what was the news from the white people; and having satisfied himself on the points which seemed to interest him most, the conversation began to flag, and we embraced that as a favourable opportunity to depart to the waggons. He was not long in returning our visit, and but little longer in being firmly located on Mr. Moffat's bed, a position he seemed greatly to admire, and which he loved, because on it, said he, "sleeps his father Amachoban." Nothing could exceed the respect shown by him for Mr. Moffat, a circumstance which was particularly pleasing to me, inasmuch as I knew it was most abundantly merited. Scarcely a day passed after this, without one or two visits, and we were kept from dying of *ennui* by the shouts and songs of the mob, which always accompanied him to and from the waggons.

As little could be obtained here which was calculated to forward the objects of the association, I informed the king, as soon as it appeared prudent, that our wish was to visit, in the first instance, the country towards the sources of the Likwa, and that we hoped to secure guides and an interpreter from him. On this occasion he, for the first time, declared his great anxiety to forward our views, and immediately stated, that whatever we required in the way of men, should be in readiness. By this time our provisions were rather low, and it became highly desirable to procure some corn, which was only likely to be effected through Umsiligas,—Mr. Kift therefore consented to remain with Mr. Moffat, in order, if possible, to procure what was necessary, and with him we left two waggons, two men, and about thirty of our worst oxen.

"On the 16th of June, the day appointed for our departure, the Matabili destined to accompany us were present at the kraal, where they received most minute instructions as to their duty, and were told

that if anything befel us whilst under their charge, they should as certainly be killed as Um'Nombâte, who was present, was then living.

"Our course, in order to accomplish the meditated journey, was nearly south-east, and the road lay over a rugged and broken country, between two ranges of hills, which rendered travelling difficult and tedious. For some days after starting, we passed occasionally kraals well stocked with cattle, but for a long time before turning back we saw nothing but the remains of stone walls of great extent, which, in former times, had confined the cattle of the various Bechuana tribes, then living in the peaceful possession of that country. Everywhere, during the outward journey, we found a fair supply of grass and an abundance of water; the sources of most of the rivers in that direction being in the range immediately to the north of us, which divides the waters that run to the eastward from those that flow to the westward. The scenery here surpassed anything we had yet seen, and, judging from all appearances, the country was much better calculated for grazing and cultivation than any portion of the district we had found the Matabili occupying; indeed none of them hesitated in acknowledging that, and stated that the fear of Dingan alone had led them to neglect it.

"On reaching the Oori River, which is fed by many fine streamlets from the range already mentioned, we were told by the guides, that beyond it water was very scarce, indeed seldom to be found within a great distance, and that it would be quite impossible to advance farther with oxen. This information I received with suspicion; yet the anxiety evinced by the guides, that Umsiligas should understand that they had afforded it, gave so much the air of truth as did not warrant me in persisting to oppose their recommendation, which I afterwards ascertained to be judicious at the time. Though they stated that the same obstacles existed to our farther advance beyond the Cashan range of mountains, which lay immediately to the north of us, yet, from its not being desirable to return by the road we had just travelled, I determined upon crossing it, and then deciding as to the course which ought to be pursued. From the position we were then in, passing the range could only be effected by one road, and that with difficulty, owing to the quantity of bush and the number and size of the stones, yet with caution it was effected, and we were again able to reach the Oori before dark, and to encamp for the night on its eastern banks, about four miles to the northward of the mountain.*

"From our new position almost nothing of the neighbouring country could be seen; and though fears were expressed that water could not be procured on the higher grounds visible to the eastward, yet the advantage to be obtained from reaching them was more than sufficient to warrant the risk and induce us to proceed. Beyond the Oori, travelling proved very fatiguing to the oxen, owing to the nature of

* The expedition appears here to have crossed Messrs. Scoon and Luckie's route in 1829.—ED.

the soil, which will be afterwards described, and had we not been so fortunate as to discover a sufficiency of water towards evening, they would scarcely have been able to have returned next day to the river to drink. This day's journey brought us to within a moderate distance of one of the highest points of the Cashan mountains, from whence, we were told, the country in all directions was to be seen to a great distance. To that we repaired on the following day, and soon found our information to have been correct, and that our waggons were near to the site of the last battle fought between the forces of Umsiligas and Dingan, towards the sources of the Umpiban. Detached hills and mountain ranges of moderate height, separated from each other by extensive intervening flats, bounded the only very extended view which we here enjoyed, namely, the one to the north-east and east. In those directions little wood was seen, and, that little was towards the bases of the hills. The soil of such of the flats as we were able to visit was of a blackish colour, highly porous or honey-combed, and into it the feet sunk deeply in walking—characters which indicated the gentle slope that here existed, and afforded evidence of the course by which the rain waters commonly disappear.

"Various reasons rendered it necessary that we should see Mr. Moffat previously to his return to Kuruman; and as the day fixed for that event was approaching, I found it imperative to rest satisfied with the distance we had reached in this direction, and to return to the place at which we had arranged, previous to starting, that he should meet us.

"Having adopted a new route for our return, our first movement brought us back to the Oori, but considerably to the north of where we last left it, and there we found a party of natives belonging to a subordinate tribe of Baquaina, under a chief named Mutsili, whose usual residence was on the Umpiban, now about a day's journey to the north of us. From this point the Oori ran nearly in a north-west direction, and for some days, as long as it kept that course, we travelled along its banks; but, upon its inclining more to the north, and entering a range of high mountains where the flies which prove so destructive to cattle exist in great abundance, we left it in order to keep the road which would bring us to the point where Mr. Moffat was to await our arrival.

"The second day after this, we passed the site of the battle fought between Barend's Griquas and the Matibili, and the appearances yet to be seen told in the strongest terms what must have taken place. The slope upon which it occurred was still actually white with the bones of men and horses; and the remnants of guns, saddles, jackets, hats, &c., proved what must have been the fate of many a Griqua.*

"On leaving the kraal where, by appointment, we met Mr. Moffat, our course was directed to the Marikwa, and from the point where we reached it we travelled along its banks to where it joins the Oori

* The expedition appears to have here reached the longitude of 28° 50′ E., in the parallel of 25½° S., about 200 miles in a direct distance from Delagoa Bay.—Ed.

and forms the Limpopo. Much of the country on both sides of that river is thickly covered with high bush, which, here and there, impeded our progress and seriously injured the canvass of the waggons. The road in several places was rugged, and the ranges of hills through or over which we had occasionally to pass affected the waggons considerably, and led to several serious accidents, which, however, were rendered comparatively unimportant from our possessing in the party the means of effectually remedying them. On arriving in about latitude 24. 30, we found ourselves upon the northern limit of the Matabili territory, and at the last kraal of Umsiligas in that direction, which kraal was inhabited principally by Bechuana of conquered tribes under a Litabili chief. For some distance after passing this outpost we met with poor natives in considerable numbers, near to the river, all of whom acknowledged themselves as tributary to the Matabili, and even wore to a certain extent their dress.

"They all appeared in a very dejected state, which was not to be wondered at, considering they were almost perishing from starvation. As we advanced, the number gradually diminished, and eventually not a human being was to be seen. This occurrence led us to fear that one of the most desirable sources of information was now out of our reach; but after travelling three days farther it was again available. Here we met with the surviving portion of the Baquaina nation, which had formerly held a high rank amongst the Bechuana tribes. This tribe, after having defended itself against the Mantatees, who were defeated at Old Latakoo, eventually sunk under the power of Umsiligas, and became tributary to him; in which condition it continued till he put to death the principal chief, when every individual with one accord fled from the country they were then occupying, and established themselves in their present position, where they now live in terror of the Matabili.

"The Baquaina entertain a marked aversion to the Matabili, and were the first Bechuana whom I saw treat our guides with indifference and contempt. They were suffering much from hunger, and the necessity of constantly residing in the thick bush rendered it difficult for them even to pursue the game which, under circumstances like theirs, forms the principal means of existence. To construct snares, or to cultivate ground, was also inconsistent with their safety, inasmuch as either the one or the other was well calculated to discover their haunts. The people of this tribe seemed to feel their destitute condition more than any we met during the whole journey, which was owing, probably, to their having formerly stood highest in point of rank, having by universal consent been admitted to have first issued from the great cave out of which, in their idea, the various Bechuana and Bushmen tribes proceeded at the beginning of the world. From them we obtained much interesting information relative to the interior, which would be out of place to notice here. It may, however, be remarked, that two of the most important points established through them were,—first, the existence of a large fresh-water lake at a great distance to the northward; and secondly, the occurrence

of a scattered Hottentot population, not only over all the neighbouring districts, but as far as, and even beyond, the lake, and that, in the latter position, tribes resembling to all appearance the Corannas, and speaking a similar language, existed yet in a state of independence, under chiefs of their own nation. The statements made in regard to the lake were vague and unsatisfactory on every point, except as to its existence,—on that no discrepancy occurred,—the appearances of the water during stormy weather were so naturally detailed, and the form of the boats, and the method of making them 'walk,' so minutely and clearly described, as proved at once that all must have actually seen what they attempted to picture. On the subject of the direction and distance, little could be ascertained with certainty,—some stated it bore north-west from us, others north-east; some that they could reach it in three weeks, others that it would require three moons. If it be kept in view that almost no two of our informants reached it from the same place, and perhaps not one without wandering and halting amongst the intermediate tribes, it will be evident that none of them were fitted to form a correct estimate either of the actual distance or direction. There can be no doubt, however, that we were still far from it, as one of our own men, who had been there, and who is a resident of Kuruman, declared that we were at a much greater distance from it than from Latakoo.

"By the time we reached the Limpopo river our oxen were very much reduced in condition, from the want of sufficient food; and grass fitted for the use of cattle had nearly disappeared: circumstances which rendered our position particularly unfavourable. To have advanced without consideration might have left us a wreck in the desert; and to have returned without ascertaining if better prospects were not before us, might and would have exposed us to just reproach, especially as there was still in this vicinity what absolute hunger would induce the oxen to consume in sufficient quantity to subsist upon. A span of the best oxen were therefore immediately selected, and a small party with one waggon proceeded to discover, if possible, the most judicious course to pursue. After travelling four days in a north-east direction near to the river, and to a point where it turned to the south-east, without any signs of improvement, nay, I may safely say, with every symptom, if possible, of increasing sterility, we halted near to a kraal of Baquaina, to discover if it were not possible to cross from thence to the Baka hills, where we had been told there were both water and grass in abundance.

"Having found from experience that direct questions are often not well calculated to elicit the truth from savages, I determined here to wait, and see if some circumstance might not occur which would enable me to obtain the information we wanted, without making it appear our principal object. That soon happened, for scarcely had the natives joined us before they began to beg for food, and entreat that we would shoot some game for them, as, according to their own expression, they were dead from hunger. I immediately told them we were ready to do that, if they would accompany us on our journey,

which remark caused joy to beam in every countenance, as they took it for granted we intended to follow the river. Upon understanding, however, that such was not our meaning, their disappointment was extreme, and all declared it perfectly impossible to cross at this season to the Baka, as not a drop of water was to be found before arriving at the mountains, which would be six days' journey for us: and, in further proof of the difficulty and danger of the undertaking, they stated that two members of their own community who had lately arrived from thence were quite exhausted from thirst, though they had carried with them several large horns filled with water. Having ascertained this much I began to question them, and the following was the result, viz.:—During the rainy season the journey could be accomplished without difficulty, but at present it was impracticable. In former times it had been customary to pass during the whole year, but then large pits existed into which the rain-water flowed, and remained during the dry season; but since the Matabili have been in the country it has been an object to render communication as difficult as possible, and therefore every artificial reservoir has been either intentionally or accidentally destroyed.

" With such apparently unprejudiced evidence before us, it would have been courting misfortune to have attempted the crossing of the country with oxen in the condition in which ours were, and highly unjustifiable, as our success had hitherto been such as to warrant a hope, that, if we reached the colony without any serious accident, further exertions would be made under circumstances calculated to produce a result very different from what we could now with reason anticipate. As soon then as the necessary observations were made, in regard to the surrounding country, we moved back to the other waggons, for the purpose of returning to Mosiga. In one excursion we left the river and travelled to a distance of some miles beyond the tropic, where, from the top of one of the highest trees, we could just faintly discern the summit of the Baka hills, due north of us. In every other direction the country between the eye and the horizon appeared nearly flat, and densely covered with brush-wood; and, if we are to believe the natives, the districts beyond the range surveyed exhibited nearly similar characters, particularly those to the east and north-east.*

" On reaching the position where we left the principal portion of the party, we found two of the oxen dead, and the others not at all improved, indeed the reverse, as was almost to be expected, considering the quantity and quality of the grass. Under these circumstances instant removal to a better provided district became a point of the greatest importance, and led us at once to proceed on the way to Mosiga. On beginning to work the oxen, we soon found they were not able to travel more than two or three hours each day, which dis-

* By the Missionary Register of 1834 it appears that Mr. Hume has reached two days' journey beyond the Baka Hills, and found many well-disposed tribes, who obtained European goods from the Portuguese, and who spoke the Sichuana language. —Ed.

covery made me for the first time feel perfectly satisfied that I had acted judiciously in not extending the journey. In our return we passed over the site of the town in which Mr. Campbell found the Baharootzi, nearly on the top of Kurrichaine, and soon after leaving it we were delighted by the arrival of four spans of oxen, sent by Messrs. Hamilton and Edwards, to supply the place of such of our own as were unable to convey the waggons over the hills which lay between us and the head-quarters of Umsiligas.

"On our starting, Umsiligas accompanied us for a short distance, conversed freely on the pleasure he had experienced from our visit, and added, that as we had not accomplished our object of visiting the '*great water*,' we must go home in peace, and return again, when he would take care we should *see it*.

"Between the Molopo and Graaff-Reinet, we travelled, of necessity, principally during the night, and but little occurred which requires notice on the present occasion. It would be unjust, however, to pass over the visit to Griqua Town, considering that much calculated to promote our object was obtained there. Waterboer, the chief, was particularly kind and communicative; so that, by his able assistance, we added much to the previous information we possessed, both in relation to the Griquas and Bushmen.

"During the return journey a considerable number of oxen died from absolute exhaustion, and eleven, which were unable to proceed, were left between the Vaal River and Graaff-Reinet, with instructions to send them on to the latter, should they eventually recover.

"To Algoa Bay it was perfectly impracticable to proceed with our own oxen,—a circumstance which rendered it necessary to provide other means for transporting the collection, the expenses of which will appear in the general account.

"The importance of the services which were rendered by the various Missionaries we visited, will, ere this, have been apparent; yet, comparatively speaking, but a small proportion of their real utility has been noticed, from the necessity of abstaining, on the present occasion, from particular details. To all of them I consider the Association to be deeply indebted for whatever degree of success has attended the exertions of the expedition, and to Mr. Moffat especially, for the friendly reception and kind treatment which we experienced from Umsiligas. To the general activity and good feeling of the majority of the members of the party itself I am bound to attribute, in a great measure, the fortunate result of the enterprise; and should it ever be my good fortune to obtain leave to proceed on another journey of the kind, I should be delighted to have with me nearly all of the individuals of the late party, and more than delighted to have those gentlemen, the fruits of whose talents are manifest in 497 beautiful drawings.

"Having now given a general outline of the proceedings of the expedition, I shall sum up concisely what appears to me to have been some of the principal results:—

"1st. It has put us in possession of much information respecting many tribes even hitherto unknown to us by name; and has enabled us also to extend very considerably our knowledge of those which had previously been visited, by having brought us in immediate connexion either with them or with persons who could furnish information regarding them. With members of twenty-seven tribes we have actually communicated, and of sixteen others we have obtained indirect information.

"2ndly. It has enabled us to ascertain the geographical position of many places previously doubtful; to lay down the sources and courses of various rivers which run to the eastward; and otherwise obtain what will considerably add to the utility of our maps of South Africa.

"3rdly. It has enabled us to extend considerably our knowledge of natural history, not only by the discovery of many new and interesting forms in the animal kingdom, but also by additional information in regard to several previously known; and has put us in possession of a splendid collection, which, if disposed of, will in all probability realize a sum more than equal to the expenses which have been incurred:—

180	Skins of new or rare quadrupeds,
3379	Skins of new or rare birds,
3	Barrels containing snakes, lizards, &c.,
1	Box containing insects,
1	Box containing skeletons, &c.,
3	Crocodiles,
2	Skeletons of crocodiles,
23	Tortoises, new or rare,
799	Geological specimens,
1	Package of dried plants.

"4thly. It has enabled us to ascertain that the Hottentot race is much more extended than has been hitherto believed, and that parties or communities belonging to it inhabit the interior as far, at least, as the inland lake, which we were told is not less than three weeks' journey to the north of the Tropic of Capricorn.

"5thly. It has made us aware of the existence of an infinity of misery in the interior with which we were previously unacquainted—a circumstance which, in all probability, will lead eventually to the benefit of thousands, who, without some such opportunity of making known their sufferings, might have lived and died even without commiseration.

"6thly. It has enabled us to establish a good understanding with Umsiligas, and insure his services and support in the further attempts which may be made to extend our knowledge of South Africa, which, without his concurrence, could never be well effected from the Cape of Good Hope; and—

"Lastly. It has furnished a proof that the plan upon which the Association proceeded was calculated to accomplish the objects it had in view, and has given reason to believe that a party similarly equipped, when assisted by the knowledge we now possess, may, with proper regard to the seasons, penetrate far beyond the latitude of

23. 26. (our northern limit), and with a termination equally fortunate as that of the late undertaking."

[At a general meeting of the Members of the Association, held at Cape Town on the 19th of March, 1836, Sir John Herschel in the chair, it was resolved unanimously,—

> "That the only adequate thanks which can be rendered to Dr. Smith are, that he be requested to undertake the next expedition."]

It is to be hoped that the important geographical information obtained will soon be made public.

II.—*Notice of the Chronometric Expedition of Lieutenant-General Schubert, executed in 1833, to determine the Longitude of the most important Points on the Coast of the Baltic.* Communicated by M. Kupffer, Mem. Ac. Scien. St. Petersburg, Corr. Mem. R.G.S. of London.

By order of the Emperor, a steam-boat and fifty-six chronometers were placed at the disposal of Lieutenant-General Schubert, Directeur des Dépôts de Cartes de l'Etat-Major et de l'Amirauté, for the purpose of visiting, during the summer of 1833, the most important points of the Baltic, and of determining their longitude. That a great number of points might be visited during the short period of the northern summer, observers were sent beforehand to the various points, to determine the time, by means of transit and other instruments, which give the time with great precision. By these means, General Schubert had only occasion to stop at each point the time necessary to compare the chronometers with the astronomical clock there established, of which the rate was very exactly known by prior and subsequent observations, and was not obliged to wait for fine weather at each place.

He was thus enabled, in one summer, to make the circuit three times of all these points.

To give still greater extent to the undertaking, the Russian Government entered into communication with the Governments of Prussia, Denmark, and Sweden, who, on their part, also sent observers to the most important points of their territories washed by the Baltic. It is thus that Stockholm, Altona, and Lubeck have been comprised in the chain of points of which the longitude has been determined by this expedition. The results which have been obtained are shown in the following tables.

Place.	North Latitude.	Long. East of Greenwich. In Time.	Long. East of Greenwich. In Degrees, &c.	Diff. from Naut. Almanac and Conn. des Temps.
	° ′ ″	h. m. s.	° ′ ″	′ ″
Altona, Meridian Circle	53 32 45·00	0 39 46·600	9 56 39·0	+0 1·5
Lubeck, Transit Instrument of temp. Observatory	53 51 29·87	0 42 45·764	10 41 26·46	+0 35·03
The Nor. Tower of the Church of St. Mary's	53 52 5·88	0 42 44·798	10 41 11·97	
Centre of the Navigation School	53 51 29·98	0 42 45·654	10 41 24·81	
Old Observatory	..	0 42 41·298	10 40 19·47	
Travemünde, the Steeple	53 57 25·67	0 43 28·085	10 52 1·275	
Lighthouse	53 57 39·51	0 43 31·551	10 52 53·265	+1 41·235
Copenhagen, Observatory, Bastion of Holken	..	0 50 18·983	12 34 44·745	
Observatory of the University, or Round Tower	55 40 53·30	0 50 19·553	12 34 53·295	+0 3·705* / −0 10·795
Ankona, temp. Observatory	54 40 50·80	0 53 46·183	13 26 32·745	
Lighthouse	54 40 48·80	0 53 45·903	13 26 28·545	
Swinemünde, temporary Observatory	53 54 46·9	0 57 3·561	14 15 53·415	
Old Tower of the Pilots	53 54 47·6	0 57 3·452	14 15 51·78	
Christiansoë, temporary Observatory	55 19 23·00	1 0 47·404	15 11 51·06	−0 5·28
Conductor of Lighthouse	55 19 18·68	1 00 46·652	15 11 39·78	
Pavilion of the Gt. Tower	55 19 18·90	1 0 46·603	15 11 39·045	
Small Tower at Frederickshohn	55 19 24·00	1 0 45·865	15 11 27·975	
Karlscrona, temporary Observatory at Geitkär	55 8 51·3	1 2 24·528	15 36 7·92	
Tower of the Clock	56 9 30·96	1 2 20·879	15 35 13·185	
German Church	56 9 39·11	1 2 20·795	15 35 11·925	
Admiralty Church	56 9 25·47	1 2 21·995	15 35 29·925	
Humholm Church	56 9 40·80	1 2 23·669	15 35 55·035	−1 59·537
Pavilion at Drottningskär	56 6 39·55	1 2 15·843	15 33 57·645	
Lotskik at Aopo	56 6 29·96	1 2 13·878	15 33 28·17	
Oland, temporary Observatory	56 11 47·65	1 5 39·515	16 24 52·725	
Lighthouse	56 11 49·66	1 5 39·446	16 24 51·69	
Stockholm, transit Instrument of Observatory	59 20 34·80	1 12 16·504	18 4 7·56	−0 25·06
Church of St. Katherine	59 19 7·06	1 12 22·137	18 5 32·055	
Arholma, Lighthouse	59 50 58·20	1 16 29·486	19 7 22·29	
Söderarms, Lighthouse	59 45 15·16	1 17 40·954	19 25 14·31	+1 23·19
Westerskär, Signal	59 35 34·91	1 16 38·730	19 9 40·95	
Lands-Ort, Lighthouse	58 44 27·93	1 11 31·118	17 52 46·725	−0 39·225
Dantzig, Observatory of the Naval School	54 21 19·5	1 14 41·056	18 40 15·84	−0 40·345
Tower of Parish Church	54 21 4·0	1 14 39·103	18 39 46·545	
Old Observatory on the Bischofsberg	54 20 47·5	1 14 35·523	18 38 52·845	
Lighthouse at Neufahrwasser	54 24 15·9	1 14 41·823	18 40 27·345	
Steeple at Weichselmünde	54 23 49·5	1 14 45·529	18 41 22·935	
Gothland, temporary Observatory at Katthamra	57 25 52·93	1 15 26·685	18 51 40·275	
Grogarn Lighthouse	57 26 29·47	1 15 0·755	18 45 11·325	
Koenigsberg, Observatory	54 42 50·38	1 22 0·885	20 30 13·275	−0 5·775* / −0 8·775
Swalferort, Lighthouse	57 54 35·37	1 28 20·987	22 5 14·805	
Dagerort, do.	58 54 59·13	1 28 47·571	22 11 53·565	
Abo, Old Observatory of the University	60 26 58·00	1 29 10·045	22 17 30·675	−0 18·675* / −0 23·175

Those marked thus * are from the Nautical Almanac.

Place.	North Latitude.	Long. East of Greenwich.		Diff. from Naut. Almanac and Conn. des Temps.
		In Time.	In Degrees, &c.	
	° ′ ″	h. m. s.	° ′ ″	′ ″
Odensholm, Lighthouse .	59 18 19·31	1 33 27·919	23 21 58·785	
Surop, do. .	59 27 55·00	1 37 32·609	24 23 9·135	
Torkala Udd, do. .	59 56 10·32	1 37 35·284	24 23 49·26	+2 53·24
Norgou, do. .	59 36 22·23	1 38 4·251	24 31 3·765	
Reval, Transit Instrument of the Observatory	59 26 7·48	1 39 11·539	24 47 53·085	−1 30·585
Cathedral	59 26 19·77	1 38 58·676	24 44 40·14	
Church of St. Nicolas .	59 26 15·61	1 38 59·534	24 44 53·01	
Church of St. Olay .	59 26 35·08	1 39 0·908	24 45 13·620	
Kokskär, Lighthouse . .	59 41 59·64	1 40 6·846	25 1 42·69	
Helsingfors, Observatory of the University .	60 9 41·97	1 39 49·911	24 57 28·665	+4 18·835
Klok Hapel, Tower of the Town Hall . .	60 10 10·12	1 39 50·541	24 57 38·115	
Church of Holy Trinity	60 10 15·14	1 39 49·616	24 57 24·69	
Lutheran Church in the new suburbs . .	69 9 58·14	1 39 46·811	24 56 42·165	
Socaborg, Windmill of Westersoart . . .	60 8 54·05	1 39 55·184	24 58 47·76	
Pavilion at Gustafs-Vård	60 8 22·60	1 39 58·558	24 59 38·37	
Gråcharn, Lighthouse . .	60 6 18·48	1 39 55·517	24 58 52·755	+3 24·745
Ekholm, do. . .	59 41 8·11	1 43 11·927	25 47 58·905	
Rotshar, do. . .	59 58 10·17	1 46 43·773	26 40 56·595	
Hockland, temp. Observatory	60 6 17·07	1 47 50 888	26 57 43·32	
Mägge, Palus (northern extremity of the triangulation of M. Struve)	60 4 29·09	1 47 54·105	26 58 31·575	
Upper Lighthouse . .	60 5 40·57	1 47 49·597	26 57 23·955	+0 7·515
Lower do. . .	60 6 19·68	1 47 50·871	26 57 43·065	
Chimney of the Coasting-Pilots' house	60 5 34·96	1 47 55·428	26 58 51·42	
Dorpat, Meridian Circle of the Observatory		1 46 54·056	26 43 30·84	+0 14·16* +0 4·66
Sommers, Lighthouse . .	60 12 25·33	1 50 34·760	27 38 41·4	
Sishar, do. . .	60 2 8·92	1 53 27·827	28 21 57·405	
Tolbuchin, do. . .	60 2 35·18	1 58 10·339	29 32 35·085	
Bioanaia, Signal-staff on Hill	59 55 5·42	1 58 31·926	29 37 58·89	
Kronstadt, temp. Observatory	59 59 29·30	1 59 1·000	29 45 15·	
Steeple of the Cathedral	59 59 45·90	1 59 4·026	29 46 0·39	
Observatory of the Pilots' School . .	59 59 23·16	1 59 3·563	29 45 53·445	+3 44·055
St. Petersburg, Observatory of the Academy of Sciences . . .	59 56 31·46	2 1 13·369	30 18 20·535	+0 36·465* +0 35·965
Observatory of the Etat-Major	59 56 17·28	2 1 16·108	30 19 1·62	
Observatory of the Corps de la Marine . .	59 56 7·74	2 1 7·383	30 16 50·745	
Pulkowa, Central Observatory (lately founded), centre of the middle tower . . .	59 46 20·43	2 1 18·565	30 19 38·475	

[The column marked 'Difference' shows the *excess* or *deficit* of the longitudes as given in our best authorities, the Nautical Almanac of 1837 and Connoissances des Temps of 1838 (marked + or —), of the longitudes as given by Gen. Schubert, assuming these as the Standard—*e. g.* Copenhagen by the Nautical Almanac is in long. 12° 34′ 57″ or 3″·705+, or in excess of Gen. Schubert's determination.

N.B. Altona, the point of connection with Greenwich, agrees precisely with its position as given by the Nautical Almanac for 1837.—Ed.]

According to the custom of our navigators, the longitude has been calculated from Greenwich, although this point has not been visited by the expedition; yet, as the difference of the longitude of Greenwich and that of Altona, the most western point of our chain, is exactly known, it was easy to reduce all the longitudes to the meridian of Greenwich.' The latitudes have also been added, as ascertained by former astronomical observations, or determined by the last triangulation, also executed under the direction of Lieut.-Gen. Schubert, as well as by observations made during this expedition.

III.—*On Ground-Ice* in the Siberian Rivers.* Communicated by Colonel Jackson, F.R.G.S., (St. Petersburg).

Every observation made by the naturalist, which seems to contradict the laws of nature, is condemned to disbelief till the accumulation of evidence forces from scepticism an acknowledgment of conviction. The existence of granite superimposed to secondary rocks, so long denied, is now a fact received and accounted for. In like manner the phenomenon of ice formed at the bottom of rivers has been too frequently observed, and too well authenticated, to admit of further doubt, and now only requires to be satisfactorily explained. As it is but very lately, however, that the subject appears to have engaged attention, fresh observations are still desirable, and I doubt not but the present translation of an article, written by Mr. Weitz †, and as yet unpublished, will be read with interest:—

" In traversing the rapid rivers of the north, in the beginning of the winter, it is easy to persuade oneself of the formation of ground-ice. These rivers, near their sources in the high lands, flow with great rapidity over a sandy or stony bed, and, notwithstanding the intensity and duration of the cold, and the abundance of snow, they continue to flow, bearing along vast quantities of floating ice, brought from their source, and augmented by what is detached from the sides, as also by what rises from the bottom.

" The Kann is a river of this kind; it takes its rise in a branch of the Saiansk mountains, and empties itself into the Jeneseï, forty versts from Krasnojarsk. I traversed this river in November, after much hard frost, and had an opportunity of observing the

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* I by no means approve of the term ground-ice as applied to that which is formed at the bottom of rivers, and merely use it in conformity with custom. I think the term *bottom-ice*, though certainly less elegant, more explicit. I would confine the term *ground-ice* to that which is sometimes found a few feet below the surface of the soil in the ground itself.

† Superior Officer of the Imperial Russian Mining Corps. The original is in Russ.

formation of ice at the bottom. The ice presents itself in the form of long prismatic and pyramidal crystals, collected sometimes into large masses reposing on the bottom, from which they seem to grow. The great transparency of these rivers enables us to see clearly what is at the bottom. At a depth of fourteen feet and more one might see the ice formed at the bottom, whose greenish tinge gave it an appearance somewhat similar to that of patches of the *confervoideæ*. Sometimes these masses, without any visible cause, get detached from the bottom, rise to the surface, and, becoming more compact by contact with the cold air, are floated away with the other flakes. It frequently happens that these pieces, in rising from the bottom, bring up with them sand and stones, which are thus transported by the current. Arrived at those parts of the river where, from the very little slope of the bed, the motion of the water is slow, and where the surface is sometimes frozen over, these floating masses collect, rub against each other, and get fixed; whence the inhabitants affirm that the river first freezes towards the lower part of the stream, and that from thence the congelation proceeds upwards till it reaches the higher and most rapid parts. Others assert that, where the water is shallow the ice begins to form at the bottom, and increases upwards by degrees till it gains the surface; thus forming a barrier to the ice-meers which come down, and contributing by this means to the congelation of the surface of the whole river. When the thaw sets in, the ice becoming rotten lets fall the gravel and stones in places far distant from those whence they came.

"This phenomenon has as yet been remarked by myself only in the river Kann, but it is seen in the Angara, which passes near Irkoutsk, and several persons have observed it in the Wolga. It is my opinion that it must be common to all the rivers of the north, whose rapidity prevents their freezing at the surface, notwithstanding the intensity and duration of the cold. If I hazard an explanation, founded on physical laws, it is with diffidence, and in the hope of inviting to the subject the attention of those better able than myself to do it justice.

"I conceive that the intensity and long continuance of the cold may freeze the soil to the depth of the bottom of the river, particularly where it is not deep, and that there the diminished velocity of the water permits its congelation, particularly if there be any hollows, where the water remains stagnant. So long as the congealed masses continue small with regard to the volume of water immediately above them, they adhere as if rooted to the bottom, but when by degrees they increase in bulk, the difference in their specific gravity operates to overcome their adhesion to the bottom, and they rise, bringing with them, as we have said, such gravel and stones as we find attached to them; whence we may

conclude that not only does the current occasion a change in the bed of the river by its erosion of the looser soil which it carries from one place to depose in another, but that the ice which forms at the bottom of rapid rivers, in very cold countries, tends also to effect a change in the beds of those rivers."

There can be no doubt of the truth of the facts above stated. It were desirable that Mr. Weitz had been more particular in describing the nature of the crystalline forms of the ground-ice of which he speaks; it seems to differ entirely from the scaly formation mentioned in the paper on the congelation of the Neva, as well as from the concreted cauliflower-like masses mentioned by Dr. Farquharson in the paper lately read before the Royal Society. All the observations hitherto made confirm the fact that the process of freezing is different at the bottom of a river from what it is at the surface. The greenish colour of the bottom-ice, as observed by Mr. Weitz, is also a remarkable circumstance.

I am ignorant of the details of both Mr. Arago's and Dr. Farquharson's observations, and therefore know not whether or not these gentlemen and others have ascertained the temperature of the water in its whole mass when they found *bottom-ice.* This I think essential to any satisfactory explanation of the phenomenon in question. Mr. Weitz's opinion is the same as that entertained by myself, and accounts, I think, very naturally for the formation of the *bottom-ice.* I can with difficulty admit radiation as the cause, and still less a precipitation of hoar-frost, according to Mr. Easedale's theory. I strongly suspect that no congelation can take place at the bottom of a river but when the whole mass of its waters are at, or very near, zero, in which case the water will freeze wherever the motion is sufficiently retarded. If, as Mr. Farquharson observes, rivers are often raised above their usual level in consequence of the formation of *bottom-ice,* the quantity must be great indeed; for water in freezing increases too little in bulk, one would think, to produce so great an effect.

But to return to Mr. Weitz. He seems, I think, to attribute too much influence to the bottom-ice, in supposing that the quantity of sand and gravel which it displaces can in any way assist in effecting a change in the bed of the river.

Without further comment, I shall conclude by expressing a wish that carefully directed observations were made in different parts of the world, and under different circumstances, with a view to increase the number of facts, and to ascertain with certainty the law by which the phenomenon is regulated.

IV.—*On the Country around Port Philip, South Australia.* By J. H. Wedge, Esq. Communicated from the Colonial Office.

Mr. Wedge landed at Port Philip on the 7th August, 1835, at the encampment of the party left for the purpose of maintaining the friendly intercourse with the aborigines of that part of Australia. He found several families of natives residing with the white men left by Mr. Batman, together with Buckley, the Englishman who had joined the former party, after having passed thirty-three years of his life with the natives. Of this man's curious narrative we subjoin the following brief particulars:—

Buckley was born in Cheshire, and having entered the army, was, after two or three years' service, transported for life, having, with six others, turned out to shoot the Duke of Kent at Gibraltar. He arrived at Port Philip in 1802, with a detachment of prisoners destined to form an establishment at that place. He was employed as a stone-mason (his former trade) in erecting a building for the reception of Government stores. A short time previous to the abandonment of the settlement by Colonel Collins, he absconded with two other men, named Marmon and Pye: the latter left his companions before they reached the river at the northern extremity of the Port, being exhausted with want of food and other privations. Marmon remained with Buckley till they had wandered nearly round the Port, but left him somewhere on Indented Head, with the intention of returning to the establishment; but neither he nor Pye were ever heard of afterwards. Buckley thus alone, continued his wanderings along the beach, and completed the circuit of the Port. He afterwards proceeded a considerable distance along the coast, towards Cape Otway; he, however, at last became weary of such a lonely and precarious existence, and determined on returning. Soon after he had reached, on his way back, the neighbourhood of Indented Head, he fell in with the family of natives with which he continued to live till the 12th July, 1835, the day on which he joined the party left by Mr. Batman.

His memory fails him as to dates, but he supposes his falling in with the natives to have occurred about twelve months after his leaving the establishment. The natives received him with great kindness: he soon attached himself to the chief, named Nullaboins, and accompanied him in all his wanderings. From the time of his being abandoned by his companions, till his final return to the establishment, a period of thirty-three years, he had not seen a white man. For the first few years, his mind and time were fully occupied in guarding against the treachery of strange Indians, and in procuring food; he however soon acquired a perfect knowledge of the language, adopted the native habits, and became quite as one of the community. The natives gave him a wife, but dis-

covering that she had a preference for another, he relinquished her; though the woman and her paramour forfeited their lives, having violated the custom which prevails amongst them: for, when a woman is promised as a wife, which generally happens as soon as she is born, it is considered a most binding engagement, the forfeiture of which is visited with most summary vengeance. Buckley has had no children, either legitimate or illegitimate: during the whole time of his residence, his adventures have been devoid of any remarkable interest, having passed nearly the whole of the time in the vicinity of Indented Head, excepting only on one occasion, when he travelled about 150 miles to the westward of Port Philip.

He describes the natives as cannibals, rude and barbarous in their customs, but well disposed towards the white men. He was unable to introduce amongst them any essential improvements, feeling that his safety chiefly depended on his conforming exactly to all their habits and customs. Although he was always anxious to return to civilized life, he had for many years abandoned all hope of so doing. The following circumstance, however, eventually restored him to his countrymen:—Two natives residing at the establishment left by Mr. Batman had stolen an axe, and having, by others, been assured that the theft would be severely punished, they absconded, and accidentally fell in with Buckley, communicated to him the fact of white men being in the neighbourhood, and their reason for running away; also saying that they would procure other natives, and return and spear the white men. Buckley succeeded in dissuading them from this outrage, and proceeded in search of Mr. Batman's party, and in two days succeeded in joining them. The Europeans were living in a miserable hut, with several native families encamped around them. On being observed, Buckley caused great surprise, and, indeed, some alarm; his gigantic stature, his height being six feet six inches, enveloped in a kangaroo skin rug, his long beard, and hair of thirty-three years' growth, together with his spears, shield and clubs, it may readily be supposed presented a most extraordinary appearance. The Europeans believed him to be some great chief, and were in no little trepidation as to his intentions being friendly or not. Buckley proceeded at once to the encampments, and seated himself amongst the natives, taking no notice of the white men, who, however, quickly detected, to their great astonishment, the features of a European: and after considerable difficulty, succeeded in learning who he was. He could not in the least express himself in English; but after the lapse of ten or twelve days, he was enabled to speak with tolerable fluency, though he frequently inadvertently used the language of the natives. The family with which Buckley so long resided were greatly attached to him, and bitterly lamented his leaving them. He resides at

present at the settlement formed by the gentlemen who have associated to form a new colony, through the means of the friendly intercourse which has been here established. He expresses his intention of remaining for the present, for the purpose of being the medium of communication with the natives. On his receiving the conditional pardon which His Excellency the Governor most humanely and promptly forwarded to him, on his case being made known, and hearing of the meritorious assistance he had afforded the settlers, he was most deeply affected; and nothing could exceed the joy he evinced at once more feeling himself a free man, received again within the pale of civilized society.

The natives, as before stated, are cannibals, but they do not indulge in this horrible propensity except in times of war, when the bodies of those who are killed are roasted and eaten. They make no secret of this barbarous custom, but speak of it as a matter of course; and coolly describe their manner of preparing the repast, the process of which is too revolting to commit to paper. They have another custom, exceeding, if possible, the above in cruelty; namely, that of destroying their new-born children, if born before the former child has reached the age of three or four years, until which time they are not weaned; and it is to avoid the difficulty of providing sustenance at once for two children, that this revolting practice is pursued, necessarily greatly thinning the population. Polygamy is common amongst them; few of the men having less than two wives, and some of them four or more. The women, as usual with most uncivilized people, are completely subservient to the men, acting merely as their servants, receiving little in return but austerity and violence. In the regulations which prevail respecting their wives, they have one which seems to have some connexion with, or resemblance to, the Mosaic law: on the death of a husband, his wives, whatever be their number, become the property of the eldest of the brothers, or his next of kin. They have a very curious custom of prohibiting the man from looking at the mother of the girl given to him in marriage: this is adhered to with the utmost strictness, and the greatest concern is evinced if, by any accident, the mother is seen. They are astonishingly dexterous in the use of the weapons employed in defence of their persons; and in tracking each other, the kangaroo, or other animals: their senses of seeing, hearing, and smelling are surprisingly acute.

These people seem to have no idea of a Supreme Being, although it is somewhat difficult to reconcile this with the fact of their believing in a future state; for they certainly entertain the idea that, after death, they will again exist in the forms of white men. This is obviously a new idea, since they have become acquainted with us, and leads us to hope that the friendly intercourse we have established

may tend to the expansion of their intellect, and, consequently, the amelioration of their condition. Their habitations are of the most rude and simple construction, being made of the branches of trees, arranged with tolerable compactness, at an angle of about 45°; in shape they form a segment of a circle; and their size is in proportion to the number of inmates of which the family is composed.

In traversing the interior of the country, my attention was directed to that part of it from the northern extremity of the Port, round to the westward, including Indented Head, and embracing about forty miles inland.

The peninsula of Indented Head is about 100,000 acres in extent. It is bounded on the west by the Barwurn, a river discovered by myself, which empties itself into Bass's Straits, a few miles to the westward of Indented Head, and in its course passes within about three miles of the western extremity of Port Philip. The eastern part of this peninsula, for about four or five miles from the margin of the Port, is a low and flat surface, the soil being light and sandy, and well covered with grass, thinly wooded with the honeysuckle, the oak, mimosa, and eucalyptus. The land then swells into low tiers, and alternates with beautiful hill and dale. On these hills the soil is of finer quality, and the grass more luxuriant, than on the plains. They gradually decline to the westward in gentle undulations, and terminate at the Barwurn, in some places in steep banks, varying in height from thirty to sixty feet. It is a great drawback to the availability of the peninsula, that the river Barwurn is subject to the tides, and is consequently salt up to where it is joined by another river, about three miles from the western extremity of the Port; otherwise it would be one of the finest situations for sheep-farming I have ever met with. On the peninsula there are many small water-holes, which afford the natives a supply of water; but it is brackish, and of bad quality, although I experienced no ill effects from the use of it. At the junction of the rivers above alluded to, the one coming from the north-west is called the Yaloak by the natives; the other, coming from the westward, I have named the Byron, into which, about ten or twelve miles up, another stream falls, which I have named the Leigh. These rivers pass through very extensive open plains, much farther than the eye can reach, and, from Buckley's information, at least 150 miles to the westward. About fifteen miles, in a south-west direction, from the junction of the Byron with the Yaloak, is a lake, called by the natives Moderwarrie; the intermediate country being grassy hills (called by the natives Burrubull) of moderate elevation, thinly covered with the she-oak trees; and around the lake, an undulating grassy country, thinly timbered, extends to the westward.

On approaching the coast to the southward, the country gradually becomes more thickly timbered, and the quality of the soil not so good. The coast hence trends nearly south-west to Cape Otway, the country being hilly, and thickly wooded; and, from its appearance, I should not deem it fit for agricultural purposes, although it not unfrequently happens that very erroneous ideas are formed by judging of the nature of a country by distant observations.

Near the northern extremity of the Port, and about three or four miles from it, two rivers form a junction,—the one coming from the north, and the other from the eastward; and their united waters are discharged into the Port together. Both these rivers are navigable for vessels of about sixty tons, for five or six miles above the junction. There is a bar at the mouth of these rivers, which precludes large vessels from entering; but up to the bar vessels of the largest burthen can approach, and find secure anchorage. The country between these rivers, extending to the north forty or fifty miles, and to the east about twenty-five miles, to a tier of mountains, which range from the back of Western Port in a northerly direction, is undulating, and intersected with valleys, and is moderately wooded, especially to the east and north-east: to the north there are open plains. The soil is a sandy loam, and is generally of good quality, and in some of the valleys very rich: the surface is everywhere thickly covered with grass, intermixed with the rib-grass and other herbs. I think very highly of this part of the country, and consider it to be well adapted for agricultural pursuits. It will be desirable to form townships at the head of the salt water in each of these rivers. The river coming from the eastward is called by the natives Yarrow-Yarrow. The country between the river flowing from the northward and the western extremity of the Port, and from twenty-five to forty miles inland, is open, and partakes more of the nature of downs. The whole is thickly covered with a light growth of grass, the soil being in general stiff and shallow. About midway there is a river falling into the Port, which comes from the north-west. I do not know whether it is navigable any distance inland, as I crossed it in the first instance about twelve or fourteen miles above its entrance into the Port, and in the second a considerable deal higher up, at the foot of the range of hills which bound the plains on the north-west. About Station Mount (called by the natives Villamunata) the country is wooded, with this exception; and here and there along the shore of the Port, and along the course of the river just mentioned, the plains are quite open, as much so as the heaths of Cambridgeshire; and I have no doubt they will become valuable sheep stations for breeding flocks. It is probable they are affected by the droughts in the dry summers: but there is no country with-

out its disadvantages; and I do not think it will be worse, nor, indeed, so bad, in that respect, as the east coast of New South Wales, as it is more exposed to the south and westerly winds, from which direction the rains come; and, as far as my observations went, very heavy dews are prevalent.

The country to the north and north-west of these plains is broken and hilly; and I am inclined to think, from its appearance, it is extensively adapted for pastoral purposes. There is a great deficiency of timber fit for building and fencing purposes, the want of which will be seriously felt in this part of the country, whenever it becomes thickly inhabited. On the whole, I think favourably of the country for the general purposes of colonization.

There are not many kangaroos in that portion of the country which I examined; but those I did fall in with are the largest I have ever seen, and they are very swift of foot. There are wild native dogs, which appear to me to be a description of small wolf; and I fear great watchfulness will be necessary to protect the sheep from their depredations.

In my rambles I met with several *emus*, with whose stateliness and grandeur I was much struck. There are also some large birds of the crane kind, and the wild goose, quails, black swans, wild ducks, and teal in abundance; and they are all, with the exception of the quails, very wild, and difficult to get at.

V.—*Substance of a Letter received from J. Becroft, Esq., relative to his recent Ascent of the Quorra, dated Fernando Po, 28th February*, 1836. Communicated from the Colonial Office.

Although the Company at Liverpool which sent out the expedition to the Quorra in 1832 has been dissolved, some enterprising merchants of the same city have determined to make still further efforts to establish a trade with this part of the world. With this view the steam-boat Quorra, which had been lying at Fernando Po since the close of the former expedition, was during last year purchased and placed under the command of Mr. Becroft.

A party, consisting of Mr. Becroft and four other Europeans, with thirty Kroomen, departed from Fernando Po, on the 16th September, 1835, and after passing the village where the unfortunate Lander was attacked and wounded, they reached Eboe, after thirty-seven hours' steaming; here the party was received with great cordiality by King Obie. Mr. Becroft determined the position of Eboe to be about lat. 5° 55′ N., long. 6° 2′ E.* It is a

* Captain Allen, R.N., who made the survey of the river, did not get an observation at this place.

long straggling town on the bank of a creek about two and a half miles from the main stream. After making some satisfactory mercantile arrangements with the king, the party proceeded on to Idda, or, as it has hitherto been called, *Attah*, the name of the king, who, it was learned, had died shortly after Dr. Oldfield left. The town stands about 300 feet above the level of the river, and behind it the land rises to upwards of 2000 feet. The river in this neighbourhood is much broken by large islands. The king refused holding any communication with Mr. Becroft, alleging that he suspected Attah was concealed on board the steamer, in which belief he persisted, until after remaining a week and having made arrangements with Abokho, the king's brother, the expedition departed. Kirree was next visited; it is a small place, where a market is held every fourteen days: here they stayed one day and then ascended to Adacado, a walled-in town, subject to the king of Idda; it is situated on some high rocks, and from it the mouth of the Tschadda bears N. E. by E., about two miles. At this place, which is nearly 300 miles from the sea, the party remained three weeks on the most amicable terms with the natives, and succeeded in procuring two tons of ivory, though much more would have been obtained had it been possible for them to have remained longer; but the rapid falling of the river warned them to prepare for their descent immediately. After promising to return the ensuing season, the expedition, much to the regret of the natives, on the 15th October commenced their descent to Idda, where, after getting aground twice on their way down (for the river had fallen many feet), they were once more welcomed by all but the king, who still declined any personal intercourse, though in other respects he was very well disposed. On the second day of their stay here the river had only six and then five and a half feet water;* this induced them to resume their descent immediately, after making further arrangements for trade the following season. The party reached Eboe with great difficulty, the river being nearly at its lowest; in some places only three and a half and four feet deep, obliging them on several occasions completely to unload the steam-boat. They proceeded with all dispatch, touching at several villages on their way down, at all of which they met with much disposition to trade; and on two occasions only were any hostile intentions evinced, but these excited no serious apprehensions. On the 26th December the expedition reached Fernando Po, having had but one death, no case of fever, and but two of dysentery during the voyage of three months. Mr. Becroft is highly satisfied with the results of his journey, and fully intends prosecuting his labours; and we trust that the favourable issue of his exertions may induce

* The steam-boat Quorra appears to have drawn five feet water.

other attempts to establish a communication with this interesting part of the world.

This journey having been solely of a mercantile character, has added little to science; but we trust that the speedy publication of the proceedings of the former extensive expedition may put us in full possession of much valuable information. It is to be regretted that any delay has taken place, especially since the labours of the naval officer, who accompanied the expedition solely for scientific purposes, must, together with his survey of the river, prove extremely valuable.

VI.—*Expedition organized by the Imperial Academy of Sciences at St. Petersburg to determine the Difference of Level between the Black and the Caspian Seas.*

[M. Kupffer, of St. Petersburg, well known by his valuable magnetic and meteorological observations, and an active corresponding member of the Geographical Society, has kindly transmitted to us an account of an expedition which must excite great interest in every one anxious to advance our knowledge of the physical geography of the globe.]

It is well known that, in 1830, M. F. Parrot, jun., of Dorpat, in his journey to Mount Ararat, made a barometrical level by stations between Astrakhan and Novo-Tcherkask,* in order to determine the difference of level which exists between the Black Sea and the Caspian, the result of which was found not to agree with the former measurements; and especially with those which had been found by two levels executed by the same M. Parrot, conjointly with Professor Engelhardt, between two other points of these seas, viz., Taman and Kisliar.† According to these results it was adopted as a fact, without doubt, that the Caspian Sea formed the lowest point of the vast basin which the western portion of Central Asia presents; and its depression was reckoned at near 300 feet. But the last survey of this skilful observer obliges us either to reject that opinion, or at least to doubt its exactness. It is not then surprising if a great number of those who have read

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* Novo-Tcherkask is about forty miles north-east of the mouth of the river Don, where it falls into the sea of Azov. Astrakhan is about twenty-five miles from the Caspian Sea, at the mouth of the river Volga. The direct distance between these two places is 340 geographical miles nearly.

† Taman, on a small island of the same name, forms the south-eastern point of the Strait of Enikali, between the Crimea and the territory of the Cossacks of the Don, and near the mouth of the river Kuban. Kisliar is about thirty-five miles from the Caspian Sea, near the outlet of the river Terak. The direct distance from Taman to Kisliar is about 420 geographical miles.—Ed.

M. Parrot's journey to Ararat, have shown a desire to see this question resolved by a trigonometrical survey; a desire also expressed by many members of the Academy, who would immediately have had recourse to the munificence of the Emperor for the accomplishment of the plan, if, at that period, they had been able to find persons sufficiently exercised in this description of observations, to execute the work with success, and disposed to surmount its difficulties, and to brave its fatigues.

At the commencement of this year, M. Struve announced to the Academy that three of his former pupils, for whose knowledge and zeal he would be responsible, would undertake the task if the Academy would confide it to them. These three observers are M. George Fuss, assistant astronomer at the central observatory of Poulkova; M. Sabler, assistant astronomer at Dorpat; and M. Savitch, a well-known mathematician at Moscow: the two last are about to fill professor's chairs. This announcement of M. Struve was warmly received by M. Parrot, sen., who had already proposed to his colleagues to join him in drawing up a project upon this subject. M. Parrot presented three papers to the Academy, in which are set forth in full detail the labours and method of proceeding required in such an undertaking. These preliminary works being taken as the basis of the discussions, Messrs. Parrot, Struve, and Lenz, have submitted to the Academy the outline of a scientific expedition, which will have for its objects—

1st. To determine, trigonometrically, the difference of level of two points, one upon the shores of the Black Sea, the other upon the Caspian.

2ndly. To establish, astronomically, the position of the two extreme points of the line of survey, as also of other intermediate and neighbouring points.

3rdly. To make barometrical observations, for the period of a year at least, with instruments compared with each other, and at corresponding hours, upon the shores of both seas, as also during the trigonometrical operations, along the whole line of survey.

The Academy approved and strenuously supported the undertaking in all its objects; and by its request, the Minister of Public Instruction, in concert with the Minister of Finance, laid the project before the Emperor, who, on the 24th of May, granted his sanction, and placed the sum of 50,000 roubles at the disposal of the Academy to meet the expenses of this important expedition.

The Academy have, in consequence, laid down the following plan of operations:—

In order to attain with certainty the principal object of the levelling, it is necessary, in the first instance, to fix a line upon

which it is to proceed. From information furnished for the purpose by Messrs. Parrot, jun., and Engelhardt, who, from having traversed the country in every direction, are fully acquainted with it, preference has been given to the line which joins Novo-Tcherkask with Stavropol, and Stavropol with Kisliar.* This line has the advantage over all others, of traversing a country which is known, inhabited, and offering few difficulties to the traveller: moreover, Novo-Tcherkask, as a starting point, can furnish the expedition with all necessary materials. The whole of this line will be formed by successive sights taken at about two versts (7000 feet English) from each other. The interval between each, and the zenith distance from each, taken from two neighbouring points of sight, will be measured, and from thence the height of one above the other obtained; and by taking the sum of the results with their signs, + or –, we shall get the difference in the level of the two extreme points, the one on the Black Sea, and the other upon the Caspian.

The determination of the zenith distances does not present any difficulty, and will be taken by the usual method. The intervals will be obtained according to the proposition of M. Parrot; that is to say, that from every second station, and consequently every four versts, instead of a station, a small base of some hundred feet will be carefully marked off perpendicularly to the line of operations. It is evident that, by connecting at each end these small bases with the neighbouring points of sight, a series of triangles will be obtained, whose short sides (perpendicular to the line of operation) will contain some hundred feet, and the greatest about two versts, and which will touch alternately by their apex and their base. As one side of each of these triangles is known, and the angles can be determined by a theodolite, the intervals of the point of sight will be thus obtained, and by these and the zenith distances the difference of their heights.

Two observers, provided with theodolites, would furnish two series of observations independent of each other, and which would respectively control each other. One of this series should be designated the northern, and the other the southern series.

The angles of azimuth will give at the same time the survey of the country across which the line of operations will pass: lastly, it will be easy to connect with the principal work the trigono-

* The direct distance between Novo-Tcherkask and Stavropol is 175 geographical miles; from Stavropol to Kisliar 215 miles; making the whole distance along the proposed line of level 390 miles, on a general bearing of N.W. and S.E., or a diagonal line connecting two extreme points of the two former lines of levelling, which ran nearly parallel to each other in about an east and west direction, and at about 150 miles apart.—Ed.

metrical determination of the height, and the positions of the principal peaks of the chain of Caucasus, which will be visible along a great extent of the line of survey.

To ensure success as far as possible, the three observers will, with the instruments of the expedition, and under the direction of M. Struve, make a trial of levelling, upon an extent of about twenty versts. M. Massing will accompany the expedition as mechanic, to keep the instruments in order.

As to the barometrical observations, from the commencement of the work, two barometers provided with psychrometers will be sent to Taganrog, and to Astrakhan; M. Manne, school-director at the former, and M. Osse, a medical man at the latter, will be directed to observe them, and to note the changes several times a day during the time of the operations. The expedition will have three barometers, two of which, during the whole line of levelling, will be observed simultaneously wherever zenith distances shall be measured. These three barometers will serve also to compare the barometers fixed at Taganrog and Astrakhan, both at the beginning and the end of the operations, as also during the interruption in winter.

To ensure success, the duration of the expedition has been fixed at eighteen months; the members will leave St. Petersburg in the course of July, 1836; the trigonometrical operations will begin in the autumn, the most favourable season for this object, and will be suspended during the severe months of the winter, to be recommenced in the following spring.

The expedition will be furnished with the following instruments:—

A grand universal instrument by Ertel; horizontal circle twelve inches; vertical circle eight inches.

Two astronomical theodolites of eight inches, from Munich.

A small universal instrument; horizontal circle six inches; vertical circle four inches.

A transit instrument.

Seven mountain barometers, according to M. Parrot's construction; and spare tubes.

Two psychrometers.

Four chronometers.

Three compasses, &c. &c.

VII.—*Letter from Mr. Davidson to the Secretary of the Geographical Society, dated Wednoon, 22nd May,* 1836.

Sir,—Hitherto I have had nothing of sufficient interest, in a geographical point of view, to warrant me in troubling you with a

letter. I cannot, however, fairly embark for Soudan without sending you a few cursory observations. After great difficulties, considerable expense, and much danger, I succeeded in passing through Lower Suse; and, overcoming all the obstacles thrown in my way by the Moorish government, and eluding their vigilance, I reached this place on the 22nd of April; since which, I have made excursions in every direction but North; twice to the Arab encampment in the Sahara, in hopes of making some arrangement for the furtherance of my object: in all these I was unsuccessful, and was fearful I should have to wait the departure of the Cafila from this place, but which will not set out till the beginning of September. This, added to the vexatious and expensive delays to which I have been already subjected, tended to damp my spirits, and throw a doubt upon my success. A portion of the great Cafila (which is expected to arrive in three days) reached this place on the 19th inst., and I lost no time in trying the all-powerful effect of gold on the five Dummany guides, to induce them to return to Soudan as soon as the fair was over, and their animals properly rested and fed for the journey. Sheik Beyrook, whose hospitality I am enjoying, and under whose protection and with whose sanction I travel, backing my suit, and stating that he has orders to forward me to Timbuctoo to attend the Sultan—the Dummanies required two days to consider the matter, and within the last hour have brought their answer, which I am truly happy to say is affirmative.

During this interval, everything that could be urged was most forcibly used to dissuade me from undertaking the journey at this season of the year; and great doubt as to whether even the children of the desert would make the attempt; the heat would be too oppressive for me to bear, the wells would in all probability be dry; the Deleim, the tribe most feared, would be all on the look out, as the ostrich-hunting season was coming on; add to this the danger that so small a party would run, and the suspicion it would create in seeing them returning at this unusual season, with many other objections;—to these, again, the news the Cafila has brought, viz., that the Foulanies had experienced a serious defeat from the people of Bambara; that their loss in killed and wounded was immense; that the crops in the north of Soudan had almost wholly failed; that the Tuaricks, who had been driven from the neighbourhood of Timbuctoo, had taken up a strong position on both sides of the river, three days' journey to the east of the city, and were threatening to make a descent; that more than half the population had quitted Timbuctoo, partly from fear, and partly to seek subsistence. These last remarks are, I must confess, somewhat disheartening.

I have, however, notwithstanding, resolved on going; and would rather trust to Providence and a good constitution, than

run the risk of making some secret enemy here, or having my intentions known upon the route. We have decided not to take the caravan route at all. My Dummanies are so pleased this morning to think that I dare face all these dangers, and my having put it to them that being a firm believer in the mercy and protection of Providence, and a dutiful subject of my Lord the King, whose commands I am obeying, that I have no cause to fear. The Sheik Khurfee, whose friendship I have purchased, takes charge of me by command of his superior Sheik Beyrook. This man, now advanced in years, has made the journey twenty times, and four of these by a direct line from Wednoon, having once performed the journey in twenty-five days: he tells me if I can bear it, he will take me in thirty-five, as he wishes to show me two places where we are to stop a day or two, or he will make it forty days. He states there are but two wells on the whole route; these will very likely be dry;—we carry water for forty days, but he tells me he shall not give me any water on the road only at the two halts; that the *herie* I am to ride will give me milk, and that he hopes to make me one of the *Eshrub el Rukh*, which performs the whole journey without eating, its allowance being camel's milk. I find I can work hard the whole day upon a draught of this, its satisfying quality being such that no other food is required. I have been some time in training; a small portion of meat but every other day, no bread, a little tea; and milk the day I do not take meat. With the exception of my stay at Mogador, I have had no bed for five months; I can nearly warrant myself sun proof, my face, hands and arms, feet and legs, having been three times excoriated. I have now acquired the power of resisting the action of the sun; I have adopted in toto the Arab dress, and am nearly as brown as some of the Paria caste.

From this we are to set out on the 6th of June, that being one of their lucky days; so that by the time this reaches you, I hope, please God, to have arrived, or nearly, at Timbuctoo. I have established a code of communication with my friend Mr. Willshire, the Consul at Mogador; I cannot sufficiently express my great obligations to this gentleman, without whose powerful assistance I could not have reached this place. I shall have much to state to the Society relating to him, and I have requested him to communicate with you on all occasions that he may hear of or from me. I shall write to you, my dear Sir, as fully as I can from Timbuctoo on my arrival. As letter-writing in this country is both difficult and dangerous, may I beg the favour of you, on any occasions that you may hear of me, to insert a line in some of the public papers for the benefit of my numerous friends.

With respect to the map, it has pressed all the places

in Suse too much to the west, excepting Terodant, which is as much too far east: it lays down the river Suse as considerable; it is quite dry fifteen miles from its mouth; the course of the Messa is nearly south, or S. ½ E.; Wednoon does not stand upon the river Akassa, nor is that the name,—it is the Assaka, and is 20 miles to the south. The course of the river (now dry) upon which Wednoon stands, runs E.S.E., and comes from the mountain near Terzerert, and the water is lost at Assereer, about 7 miles E.S.E. of Wednoon. Sok Assa is only 22 miles distant from Wednoon due east; Adrar at least 50 miles south of the position in which it is placed. I have been beyond the point marked, to a large Douar, and was told it was more than two days' journey to the south of the point at which I was. I can learn nothing of the Gebel Khal, although there are many of the Abusilahs here from Wadan. I merely mention these points; I hope to be able to show you on my return the positions they should occupy.

I must apologize to you for this letter, but it is written on the ground in an Arab tent, swarming with vermin, and I am frequently obliged to leave off in the middle of a word, from persons coming in, to whom a pen and paper are fearful things; it is a powerful weapon in our good country, but possesses mightier influence in these regions. I had forgotten to mention a curious circumstance relating to the weather here: the cold is most severe even at this period; they tell me they never get in their corn until the cold comes on, which lasts usually till the harvest is finished: we are all glad to put on two cloaks, although a month ago the heat was oppressive in the extreme. The small-pox is raging with great violence here and in the towns, and they fear will much lessen the number of persons expected at the Sok; I have more than one hundred patients, and nearly the whole population is under inoculation. This morning I have superintended the inoculation of the slaves, who have arrived within the last three days; the operation is performed here on the left ankle.

Presenting my compliments to Mr. Renouard, (to whom, and yourself, *Mulai Abou* desires his salaams,) and to those of the Officers and Members to whom I have the honour to be known,

Believe me, my dear Sir,

Yours, &c.,

JOHN DAVIDSON.

Since the above was written, private letters have been received from Mr. Davidson, dated *July* 14, at *Tekenceout, Wednoon*, from which a few extracts are subjoined :—

"On the 5th of June the great Cafila arrived, being a month after its time. It had been attacked: thirteen persons killed,

much property destroyed, and many slaves set at liberty. It brought accounts of famine in the upper part of Soudan, war in Bambara, and other fearful-sounding tales. I would listen to none; but, alas! my people would, and no persuasions could get them to start: all was stopped. I now determined upon going to the tents of the Dummanies, and trying what could be done with them, or the people of Akka, but I regret to say with no better success.

"It is decided that I had better remain here for two months, as the war that has resulted from the attack on the Cafila has set all the tribes at variance; no day has passed for the last fortnight without some engagement, the places are filled with wounded, I have to attend them all, and hope at last I shall make friends enough to carry my point successfully. Sheik Beyrook tells me that my detention here will not cause any delay in getting through the country: the only difference is, that I am stopping here during the rainy season, in which no one can travel in Soudan, instead of in the tents of the Dummanies. By the 1st of October at latest I hope to have actually started on my journey."

VIII.—*Latest Accounts from Australia.*

No very recent accounts of the progress of discovery in Australia have reached this country since the Surveyor-General Major Mitchell's official letter, addressed to the Colonial Secretary, detailing the circumstance of his excursion to explore the course of the Darling, behind the colony of New South Wales. This letter has also a painful interest attached to it, as relating the melancholy loss of Mr. Cunningham, the Colonial Botanist, who wandered from the party on the 17th April, 1835, and has not since been heard of.

"*Camp, West of Harvey's Range,*
4th September, 1835.

"Sir,—I have the honour to submit, for the information of his Excellency the Governor, the following report of the progress of the party, and result of the expedition, which his Excellency was pleased to place under my command, for the purpose of exploring the course of the river Darling.

"Having joined this party at Buree on the 5th of April, I reconnoitred the country on the following day; and on the 7th we proceeded, by a route not hitherto explored, to that part of the Darling specified in my instructions. My plan was to proceed along the high ground between the rivers Lachlan and Macquarie; and which extended farther into the interior than had been explored. Thus I hoped to avoid the necessity for crossing any rivers, or incurring any risk of

delay from floods, such as those which formerly, at the same season of the year, impeded the progress of the late Surveyor-General. Another object I had in view in choosing this route was, to extend my trigonometrical survey as far as possible along these heights into the interior.

"By this line we reached the river Darling, near the junction of New Year's Creek, in thirty-one days' travelling from Buree; having found the country so favourable that it was never necessary to unload a dray or cut a way through scrub, or to pass a night without water. On my right I had the waters of the Bogan, and on my left a connected chain of heights, whereof New Year's Range is the last.

"But a grievous misfortune befel the expedition in the loss of Mr. Cunningham, the Colonial Botanist, who wandered from the party near the head of the river Bogan on the 17th of April. After an anxious search, continued for twelve days, during which the party halted, his horse was traced till found dead, having still the saddle on, and the bridle in its mouth. It appeared that Mr. Cunningham, after losing his horse, had directed his own steps northward; we traced them into the Bogan, and westward along the bed of that river for twenty miles, and until they disappeared near a recent encampment of natives. There a small portion of the skirt of his coat was found, also some fragments of a map which I had seen in his possession: There were two distinct tribes of natives on the Bogan; but from those with whom we had communication we could learn nothing of his fate. I have ever since indulged a hope that he might have crossed to the Macquarie, and so returned to the settled districts; but this hope has not relieved me much from the most painful apprehensions, considering the disposition of the natives. Whether Mr. Cunningham really survives or not, his absence has made a melancholy blank in our party, and has certainly caused a serious loss to science.

"We found the interior country parched by such excessive drought, that the swamp under Oxley's Table-Land, mentioned by Captain Sturt, was completely dry, and only a few ponds remained in the river Bogan (which is the New Year's Creek of that traveller). Indeed, for 300 miles below that creek we drank no other water than that of the Darling. In this river there was a slight current, the quantity flowing in rapids being about as much as might be required to turn a mill. The water was in all parts as transparent as that of the purest spring well; and it entirely lost all brackish taste below an extreme point of Dunlop's Range, where a hill consisting of a very hard breccia closes on the river so as to separate the plains above it from those lower down. The taste of the water was worst where the river is nearest to D'Urban's Group: above that, at the junction of New Year's Creek, and for seventeen miles from thence downwards, it was excellent.

"When the party first arrived on the Darling, I was induced, from the favourable appearance of the reaches, to try at what rate I might proceed on the river with the boats. It was necessary to rest and refresh the cattle after so long a journey, even had I possessed no other means of proceeding farther. That part of the river bank which I

fixed on for the depôt is situated about twelve miles below the junction of New Year's Creek; the position was naturally good, overhanging the river, and commanding a good run for the cattle; but I strengthened it as a place of defence against the natives, by cutting down the few trees on it, and erecting a block-house large enough to contain all our stores and equipment.

"On the 1st of June (the sixth day after our arrival) I proceeded down the river in the boats, with the greater portion of the party; and on the following day we returned to the fort, having found too many shallow and rocky places in the river to admit of our making such progress as was necessary to enable us to accomplish the object of the expedition.

"Having next ascertained, by a reconnoissance I made as far as Dunlop's Range, with a party on horseback, that the water below was good, and the country not unfavourable to our further journey by land, we evacuated the depôt on the 8th of June (the cattle having then rested two weeks) and proceeded along the left bank of the Darling.

"As the cattle became weaker, the country, as we descended, became much more difficult for them to travel upon. It consisted chiefly of plains of naked earth too soft to retain roots, yet just tenacious enough to open in deep cracks, across which it was not always safe to ride. Impassable hollows (covered with *Polygonum juncium*) at length skirted the river so extensively, that we could seldom encamp within a mile of it, and sometimes not within three. Still we could not have existed there without the river, which contained the only water, and had on its banks the only grass for our cattle; consequently it was necessary to send a separate party to remain with the cattle at the river, generally in the presence of natives, and it required the utmost vigilance on the part of these men every night to prevent cattle getting bogged in the soft mud of the banks.

"I had proceeded thus about 300 miles down the Darling, when the weakness of the bullocks, and the reduced state of our provisions, obliged me to consider the expediency of going forward with a small party only, and at a faster rate, while the exhausted cattle might, in the mean time, be refreshing for the homeward journey. But before deciding on the separation of the party, in the presence of several powerful tribes of natives, I halted it to rest the animals, while some preparations were going forward for setting out. In two days I was convinced, from the movements I observed amongst the native tribes, that in proceeding farther at so great a risk of compromising the safety of the stationary party, I should have acted contrary to the 9th Article of his Excellency's instructions, and thereupon I abandoned the intention.

"The track of our drays had formed a road, which was much easier for the cattle in returning, so that by short marches, and occasional rests, while I explored the country on each side, we reached the former depôt on the 10th of August, having lost only six of the bul-

locks, these having either got fast in the mud of the river, or lain down exhausted and unable again to rise.

"The interior of the country, westward of the Darling, is diversified with detached groups of hills, and low ranges broken into portions resembling islands; but the general aspect thereof afforded no indication of its having then any water on its surface. From two different hills, each about twelve miles west of the Darling, and distant from each other about seventy miles, I obtained extensive views across the country; but from neither of these heights could I perceive any smoke, or even any appearance of trees, the whole country being covered with one kind of bush, forming a thick scrub, with intervals rather more open, but strewed with smaller bushes. During the four winter months just passed, no clouds gathered to any particular point of that horizon: no rain has fallen, neither has there been any dew, and the winds from the west and north-west, hot and parching, seemed to blow over a region in which no humidity remained.

"The Darling did not, in a course of 300 miles, receive a single river or chain of ponds from either side. Such was the extent of the plains on its banks, and the depth and absorbent quality of the soil, that much of the waters of high floods appear to be retained therein, besides all the drainage from the back country. Thus the springs appear to be supplied, by which the river is sustained during the present season of drought. These absorbent plains extend to about five miles, on an average, from the river on each side; hills of soft red sand bound them, and recede about three miles farther. Undulations of diluvial gravel (of a very hard siliceous breccia) succeed, and skirt the base of the heights, which generally consist of primary sandstone.

"The country eastward of the river rises gradually backwards towards the hills, by which I advanced to the Darling. There the higher grounds are more connected, and send down chains of ponds, which appear to be absorbed in the plains. The same kind of bush, however, covers the first region of high ground back from the Darling on both sides; and the character of features, and direction of valleys, were not very apparent from heights near this river.

"The general course of the Darling, as far as I had explored it (which was to the latitude of the head of Spencer's Gulf), is somewhat to the west of south-west (variation 8° 27′). This would tend to the westward of the head of Gulf St. Vincent, if the longitude of the Upper Darling were correct: but I make the longitude of that river, on the parallel of 30° S., nearly a degree more to the eastward; and from that longitude the general course tends much more nearly towards the supposed junction below, although still considerably to the west of that point, as laid down on maps.

"Having measured the whole of our route, and surveyed the country, as I proceeded, in continuation of my general survey of the colony, I had thereby the means of ascertaining the longitude of points connected therewith. Thus I place—

	Lat. S.	Long. E.
New Year's Range (clear hill) in	30° 27′ 45″	146° 53′ 00″
Oxley's Table-Land (south side)	30 11 15	146 16 9
D'Urban's Group (high south hill)	30 34 40	145 43 30
Fort Bourke	30 7 4	145 52 12

The last mentioned, being an important station, accessible at all seasons by the line of the Bogan, and available for carrying the survey into the more remote country, I have taken the liberty to distinguish with the name of his Excellency the Governor, under whose orders the survey of the colony has been connected with the geography of the interior.

"From Fort Bourke I continued the survey of the Darling, by actual measurement, corrected by intersecting distant points, and also by observations of latitude, to the termination of my journey in latitude 32° 24′ 20″ S.; and I make the longitude of that point, as deduced from this survey, 142° 24′ 26″ E.

"Having ascertained the most westerly of the two creeks crossed by Captain Sturt on his journey beyond the Macquarie to be the Bogan, and being desirous to discover the origin of the other, named Duck Creek, I sent Mr. Larmer last week to survey it. Mr. Larmer returned yesterday from the Macquarie, having traced Duck Creek upwards to a large lagoon on the margin of that river, from which other lagoons and channels also lead into this creek. Mr. Larmer found in Duck Creek extensive reaches of excellent water; but the bed of the Macquarie was dry where he made it. Thus it appears that, as the dip of the whole country is to the westward, the surplus waters of the Macquarie are conveyed to the Darling by Duck Creek, a separate channel altogether to the westward of the marshes.

"I have much satisfaction in stating that no men could have been animated with a better spirit than those of this party have been for the accomplishment of the object of this expedition. Our long journey proceeded with equal regularity and security. No cattle were allowed to stray and retard it, and both these and the camp have been vigilantly guarded and watched every night. The patient forbearance and good-will of the men towards the aboriginal natives deserve my highest praise; and certainly not less their courage when circumstances called it forth. This was most conspicuous when exposed almost singly to the savage natives, as they often were from necessity when watching the cattle on the Darling.

"I have to add that our provisions are scarcely sufficient to supply the party until it reaches Buree; also that one man is dangerously ill, and another unable to walk, from scurvy.

"I trust my humble testimony of the services these men have rendered under perilous circumstances, in expiation of the errors of the past, and with the best hopes and intentions respecting the future, will be favourably received by his Excellency the Governor.

"I have the honour to be, Sir,

"Your most obedient Servant,

"T. L. Mitchell,

"Surveyor-General."

By later accounts from Sydney, dated Dec. 22, 1835, we learn that a party of police having been sent to ascertain the fate of the late colonial botanist, Mr. Cunningham, they learned from some natives that a white man had been murdered on the Bogan; and succeeded in reaching the tribe of natives encamped on the borders of a small lake named *Budda*; three men of which were acknowledged as the murderers, and who were accordingly made prisoners. The natives stated, that about six moons since a white man on the Bogan came up to them and made signs that he was hungry—they gave him food and lodging for the night; the white man repeatedly getting up during the night excited suspicion, and they determined to destroy him, which determination they carried into effect the following morning. The officer in command of the police then desired to be conducted to the spot on which the murder had taken place,—which was at the distance of three days' journey, at a place called *Currindine*, where they pointed out some bones, which they asserted to be those of a white man; and near to the spot were found a piece of a coat, and also of a Manilla hat. Being thus convinced of the truth of their statement, and of the spot where the melancholy event had occurred, the officer, Lieut. Zouch, had all the remains collected and deposited in the ground, raised a small mound over them, and barked some of the nearest trees as the only means in his power to mark the spot. The murderers are in custody for trial.

Thus there can be no longer any doubt that Mr. Cunningham has fallen a victim to his zeal in pursuit of his favourite study. He was a zealous and enterprising botanist,—a warm-hearted friend and a good man,—and his loss is much regretted in the colony of New South Wales.

By the last accounts received, on the 1st August, we further learn that an exploring party, under Major Mitchell, the Surveyor-General, consisting of twenty-four persons, had again left Sydney, on the 15th March, 1836, for the interior, to finish the tracing of the Darling, and upon reaching the Murray, into which there is little doubt the river Darling falls, to return by the Murray to the located parts of the colony. Sturt, it will be remembered, entered the Murray from the Morrumbidgee, and no part of the former river above that junction has been traced, unless it should have happened that Messrs. Hume and Hovell crossed upon it in 1824. If the instructions with which the Surveyor-General is furnished be successfully executed, a considerable addition will be made to the geography of the colony in the direction which it is most useful to explore. There is reason to believe that the country on both banks of the Murray, and generally between the Australian Alps and the Morrumbidgee, contains fine pastoral tracts,

well watered by streams issuing from these mountains, whose summits, in one part, are usually covered with snow. The eastern side of these mountains is already celebrated as an admirable grazing country. The downs near Port Philip have lately become well known for the excellent pasture they afford to sheep. The course pursued by Hovell and Hume in 1824 discovered a great extent of rich land. The general feature and character of the vast extent of country contained within the course of the Morrumbidgee and the sea by Lake Alexandrina, by Wilson's Promontory and Cape Howe, to the 36th parallel of latitude on the east coast of New Holland, may be, in a great measure, finally determined by this expedition. In like manner, the geographical knowledge of a large portion of country to the northward of the Morrumbidgee will have been completed, by tracing the Bogan into the Darling, and the Darling into the Murray.

IX.—*New Strait at the South-western extremity of New Guinea.*

The Java Gazette, of September 1835, mentions the discovery of a new Strait in the island of New Guinea.—It appears, that as far back as the year 1826 the Dutch Colonial Minister sent Lieutenant Kolff, of the Dourga, to examine these coasts; who reported, that a river, as he supposed, existed about eighty miles to the eastward of Cape Walsh, the south-western extreme of Papua, or New Guinea. In 1828 a second expedition was sent, and the commander of it reported, that the river of Lieutenant Kolff proved to be a strait. In April 1835, the schooner Postilion, commanded by Lieutenant Langenberg Kool, was sent to decide the question; who, on his return, confirmed the latter opinion, and gave the position of the western point of the Strait in 7° 26′ South latitude, 138° 44′ longitude East of Greenwich; and that therefore Cape Walsh is no part of the large island, or almost continent, of New Guinea. The strait has been named after the Princess Marianne—the island after the young prince, Frederic Henry—and Lieutenants Kolff and Kool have given their names respectively to the north and south points of the island. Thus another atom of information is added to the balance against our utter ignorance of the shores as well as the interior of this vast island, extending from the Equator to 10° South latitude, and reaching in a N.W. and S.E. direction not less than 1200 geographical miles, or double the length of the British islands; of which, since its first discovery in 1527, and its re-discovery by Dampier in 1700, we have hardly attained any knowledge worth speaking of.

X.—*New Expedition to the Pacific and Antarctic Oceans.*

We have great gratification in announcing that an expedition on a splendid scale for discovery in the Pacific and Antarctic Oceans, is fitting out in the United States; some of the following particulars of which have been kindly communicated by Captain Basil Hall, R.N.

"The expedition will consist of a frigate of 36 guns, a store-ship of 360 tons, two brigs of about 260 tons, and a schooner of 120 tons. The first object of the expedition is to examine thoroughly the Pacific Ocean, to ascertain the existence or non-existence of many islands which from time to time have been reported by whale ships and others; and if found, to survey them and fix their position. Subordinate to this is the intention of pushing during the fine season as far south as practicable, and of exploring the unknown regions of the Antarctic Ocean. It is expected that the expedition will be ready to start in the spring of 1837; and that it will be absent during a period of three years. An Act has passed Congress for a grant of 60,000*l.* towards its outfit; and Lieutenant Charles Wilkes, of the United States' navy, a scientific and intelligent officer, has come to London, and has visited Paris and Munich, for the purpose of procuring the best instruments that these three capitals can produce."

This is as it should be—we heartily rejoice to see the United States coming forward as becomes a great nation, and assuming her proper position among the patrons of geographical discovery. The magnificent and liberal scale on which this expedition is planned is worthy of the nation that sends it forth. We cordially wish it success, and look forward with pleasure to see the names of citizens of the United States enrolled in that glorious list of discoverers, from Columbus to Back, which will be transmitted to the latest posterity as proud memorials of the countries that gave them birth, and of the individuals or governments who patronized their undertakings.

XI.—*On the Level of the Baltic.*

Col. Jackson writes from St. Petersburg that Mr. Nordenskjöld, professor of mineralogy at Helsingfors, has proposed to the Academy of Sciences to institute a set of experiments to determine the fact of the sinking of the surface of the Baltic, or the contrary. Glass tubes are, it is said, to be sunk at convenient places along the shores of the Gulfs of Bothnia and Finland, and regular observations to be made and registered, in conjunction with barometrical indications.

XII.—*New Island in the Pacific.*

The August Number of the *Bulletin de la Société de Géographie de Paris* mentions the discovery of a new island among the group of the Society Islands, in latitude 21° 59′ S., longitude 136° 12′ W. of Greenwich, by M. Denis, master of a merchant ship, on the 27th December, 1835. He describes it as about twelve miles long, low, wooded in the centre; the northern and southern extremes planted with cocoa-nut trees,—no traces of inhabitants to be seen. The island appears to lie exactly in the centre of a line connecting Gambier and Carisfort* Isles, at a distance of about 110 miles from each.

XIII.—*Foreign Works received.*

The Society has to acknowledge the receipt of the valuable Transactions of the Academy of Sciences of Lisbon, presented by the Academy, more especially of service to geographers, as containing the "Noticias para a Historia e Geographia das Naçoes Ultramarinas," among which are many of the voyages of Portuguese discovery, from Cada Mosto, the Venetian, in 1444, down to more modern times; also from its zealous corresponding member, Councillor Macedo, at Lisbon, a "Memoria sobre as verdadeiras epocas de nossos descobrimentos no Oceano Atlantico," by himself;—also a "Memoria Estatistica sobre os Dominios Portuguezes na Africa Oriental," por Sebastiaõ Xavier Botelho; Lisbon, 1836, 1 vol. 8vo., in which will probably be found some curious information, as M. Botelho was, it is believed, many years in command at the Mozambique; and a new edition of the "Vida de Joaõ de Castro," por Andrade, with notes, by D. Fr. Francisco de S. Luiz, Lisbon, 1835, 1 vol. 8vo., presented by M. Macedo, with a very civil letter, offering to search for any information the Society may wish to obtain from the Archives at Lisbon;—also from its honorary member, Admiral de Hamelin, all the recently published charts by the Dépôt de la Marine de France.

The Society has also to acknowledge the receipt of the Journal of the Franklin Institute at Philadelphia, presented by the Institute;—from Rear-Admiral Lütke, at St. Petersburg, the text accompanying his Atlas Nautique of a voyage round the world, on board the Corvette Séniavine;—from Admiral Krusenstern, a new edition of his Atlas of the Pacific Ocean, and a supplement to his "Recueil de Mémoires Hydrographiques," &c., St. Petersburg, 1835;—from Colonel Jackson (then at St. Petersburg), "La Russie, la Pologne, et la Finlande," par M. J. H. Schintzler, St. Petersburg,

* M. Denis is in error in stating that Barrow's Island does not appear in the English maps of this archipelago. We are writing with it before us, in a map published in 1832, and we believe it is to be found in all published since 1830.

1835, an important statistical and geographical work on a country with whose resources we are little acquainted ;—a "Dictionnaire Géographique et Historique de l'Empire de Russie," par N. S. Vsevoloijsky, 2 vols. 8vo., 1823; and a Hydrography of Russia, in MS. ;—from Professor Ritter, of Berlin, various pamphlets on the principal trees and animals in India ;—from Colonel Count Serristori, at Florence, three numbers of the "Statistica d'Italia," compiled with great care, and brought down to the latest period ;— and lastly from its active corresponding member, Count Gräberg de Hemsö, at Florence, his "Specchio Geographico Statistico di Marocco," with various maps, and twenty-five works on different subjects connected with geography and statistics: M. Gräberg also obligingly communicates to the Society the existence, at Siena, of three Portulani of the fifteenth and sixteenth centuries, one of which, by Gracioso Benincasa, of Ancona, bearing date 1467, seems to be valuable; and adds the following interesting particulars:—"It was upon the chart of Benincasa of 1461, formerly existing at S. Michele di Murano at Venice, that the degrees of latitude were first distinctly drawn; they were marked from the eleventh to the sixty-fourth degree. The first charts made by Benincasa bear date 1463, and may be seen in the library Pinelli, at Venice; other editions of 1470 and 1471 have been described by Tiraboschi and others: but this magnificent edition of 1467 seems to have been unknown to all the authors who have written on the geography of the middle ages. The MS. and drawing are equally beautiful; the most elegant calligraphy, the gilt letters, and ornamental initials; and the incomparable state of preservation, after 370 years' existence, all render it well worthy the attention of map collectors."

M. de Gräberg also communicates that Repetti's "Geographical and Statistical Dictionary of Tuscany" has reached its eleventh fasciculus, letter F. Zuccagui Orlandini has just completed the description of the Sardinian States; and a similar work is shortly to be published for the Roman States. But the most important is the "Statistica della Provincia di Saluzzo," by Vassalli Eandi, 4 vols. 4to., with maps and illustrations—a work highly spoken of. M. de Gräberg also points out some mistakes in Captain Zahrtmann's paper on the Zeni of Venice, especially when he quotes from Italian authorities.

XIV.—*Captain Alexander's intended Visit to the Dámaras, South Africa.*

[To the Secretary of the Royal Geographical Society.]

Government House, Cape of Good Hope, Aug. 15, 1836.

Sir,—I had the honour of stating some time ago, that I had still the same firm determination not to return to England without having previously visited some undescribed regions in South Africa. No change in this determination has taken place; but a change of circumstances has necessarily caused an alteration in my line of route.

When I undertook an expedition of discovery for the Royal Geographical Society, it was intended that I should endeavour to trace the course of the River Manice from Delagoa Bay to the Baquaina country. We were before this tolerably well acquainted with the country and people at and about Delagoa; and now Dr. Andrew Smith, having penetrated behind Delagoa to latitude 23° 26′ with the Central African Expedition, will be able to give what was expected from me relating to the Baquaina country, &c. A small portion of river then only remains for me to trace in that direction, but nothing new to describe of the people and natural productions of that region.

In a letter received some time ago from that distinguished geographer Mr. Cooley, who set on foot the Delagoa expedition, he said, "We know nothing of the Dámaras of Walvisch Bay, west coast, collect all the information you can regarding them." And again: in a letter from Captain Maconochie, the late excellent Secretary of the Society, it is suggested to me, that "if Dr. Smith has done what was expected of you behind Delagoa, it is a question whether you should go in that direction now at all; but do nothing hastily, or undertake a long and expensive land journey; be regulated by advice," &c.

I therefore maturely weighed all the bearings of the case, consulted with Dr. Smith, Mr. Chase, Major Michell, the Surveyor General, &c.; and it was agreed, that under existing circumstances a journey towards the Dámaras country was the most feasible plan for acquiring interesting information on the geography of South Africa, and that towards the west coast I should now direct my steps. Not to lose any more time, therefore, I have now taken upon myself the responsibility of visiting, in the first instance, the country north of the mouth of the Orange River.

Beyond the Gariep we know nothing. The last Missionary station is at the Warm Bath, twenty miles from the Great River. Bethany, on the Fish River, has long been abandoned. The Missionaries, who have lived long in Namaqua Land, say, that Le

Vaillant was never beyond the Orange River, and that beyond it there is a new and a splendid field for research.

A short time ago, I sent to the Society translated extracts from the journals of the brothers Van Reenen, who endeavoured to penetrate in that direction, but who failed to give any information of value, or to reach any distance.

The Dámaras are supposed to be a nation of Negroes, very different in appearance, in manners, and customs from the two great families we are acquainted with in South Africa, the Bechuana and Hottentot. The Dámaras are said to construct their habitations by placing poles together in a conical form, and covering them with skins, like the North American wigwam; the other races in South Africa have round-topped huts, thatched or composed of mats. The Bechuana and Hottentots use stabbing and throwing " assegaes," or javelins; whereas the Dámaras are said to use a short and broad-bladed weapon, with which they cut throats! In the recently published voyage of the American merchant captain, Morell, it appears there is a great trade in cattle between the Americans and the Dámaras: the natives bring their herds from the far interior, about the tropic, to barter with the Americans, and are ornamented with copper beads of their own manufacture.

I hope, therefore, that the Council of the Society will approve of the step I am about to take, without the power of previous reference to them; viz., to leave this on the 1st of September, with a waggon, for Clan William, the Kamiesberg, and the Warm Bath. My baggage is made up to go on pack oxen, when obliged to leave the waggon beyond the Orange River. With me I carry seven pack-saddles, for my clothes and those of my people; ammunition, food, presents, &c.

I do not intend to take a companion for my journey, as it is not intended to be one for recreation, but for useful labour; but I have engaged three Europeans to go with me, to keep the others in check and up to their work. The head man is Charles Taylor, a man of Kent, 33 years of age; who has been a servant with one or two officers in the East Indies, and who bears an excellent character; he is a good hand at skinning and preserving objects of natural history.

The next is Antonio J. Perreira, aged 16, a boy I engaged in Lisbon in 1834, when I went to Portugal to get authority to visit, and be assisted at Portuguese settlements in Africa. The third is Elliot, a steady soldier of the 27th, or Enniskillen regiment. The fourth is Magasee, a Bengallee by birth, thirty-six years old, sold here as a slave, and who ran away from his Dutch master to the Caffers, with whom he lived as a herdsman for sixteen years; he was one of the guides attached to the artillery in the campaign

of last year, and is a very faithful and brave man. The fifth and sixth are Henrick and Wilhem, the driver and leader of the waggon, who are both able-bodied Bastards. I get others from the mission stations to go on with me. All are engaged and contracted for before a magistrate for one year, commencing the 1st of September.

I have bought an excellent waggon for 900 R. dollars, have been supplied with rifles, fusils, pikes, a tent, ammunition, &c., from the Ordnance store, by order of his Excellency the Governor, and Messrs. Borradaile and Co. have laid in the other necessaries for the expedition in as complete and reasonable a manner as is possible. I hire oxen to the mission stations, and will economize to the utmost of my power the 300*l*. placed at my disposal, and an account shall be rendered of the expenditure.

All the party is in good health and spirits, and, relying on Divine assistance, I have no fears for the result of the enterprise, which I hope will be concluded in the course of the year 1837. The route may be from the Warm Bath (Orange River) to Walvich Bay, towards Benguela, and sweeping round easterly towards Lattakoo.

I communicated my intentions to the Association for exploring Central Africa, and annexing their answer to my Letter,

I have the honour to be, &c.

JAS. EDW. ALEXANDER, A.D.C.

By letters from Captain Alexander, dated Sept. 10, 1836, he had that day left Cape Town on his journey to the Dámaras—all well.

LIST OF GEOGRAPHICAL WORKS RECENTLY PUBLISHED.

ENGLISH.

Voyage of Discovery to the South Atlantic Ocean, by Capt. H. Foster, R.N., in 2 vols. 8vo.
Ten Years in South Africa, by Lieut. J. W. Moodie, 21st Fusiliers.
Travels in Ethiopia, above the second Cataract of the Nile, by G. A. Hoskins, Esq.
A Voyage of Discovery to Africa and Arabia, by Capt. T. Boteler, R.N.
A Summer Ramble in Syria, with a Tartar Trip from Aleppo to Stamboul, in 1834, by the Rev. Vere Monro. 2 vols. 8vo.
A Steam Voyage down the Danube, with Sketches of Hungary, Wallachia, &c., by Michael J. Quin.
A Tour in Greece and the Levant, by the Rev. Richard Burgess, B.D.
Wanderings and Adventures in the Interior of South Africa, by Andrew Steedman.
Narrative of a Nine Months' Residence in New Zealand in 1827, by Augustus Earle.
Egypt and Thebes; from Observations made during a Residence of more than Twelve Years, by J. G. Wilkinson, Esq.
Travels to Bokhara, and a Voyage up the Indus, by Lieut. Burnes.
Dr. Madden's Travels in the West Indies. 2 vols. 8vo.
Wanderings in New South Wales, Batavia, Singapore, and China, in 1832, 1833, 1834, by George Bennett, Esq., F.L.S.
Sir John Ross's Second Voyage to the Arctic Regions, with Appendix, 4to.
Visit to Alexandria, Damascus, and Jerusalem, by Edward Hogg, M.D.
Narrative of a Residence in South Africa, by Thomas Pringle.
The Rambler in America, by Charles Joseph Latrobe.
Travels in Asia Minor, by the Rev. F. V. J. Arundell.
On the State and Position of Western Australia, by Capt. Irwin. 8vo.
Observations on the Climate, Soil, &c. of British Guayana, by Dr. Hancock. Pamphlet, 8vo.
Journey across the Andes and down the Amazon to Para, by Lieut. Smyth, R.N. 8vo.
Narrative of the Arctic Land Expedition in 1833-5, under Capt. Back, R.N., by Capt. Back. 8vo.
Tables of the Revenue, Population, &c., of Great Britain, by G. R. Porter, Esq.
Narrative of a Voyage to Australia, by Dr. Wilson, R.N.
Journal of a Residence in Athens and Attica, by the Rev. C. Wordsworth 8vo.
De Laborde's Journey through Arabia Petræa to Mount Sinai. 1 vol. 8vo.
On the Early History of the Antient Egyptians, by W. Wilkinson, Esq. 2 vols. 8vo. (in progress).
Pamphlet on the Vegetation and Temperature of the Feroe Islands, by W. C. Trevelyan, Esq.

Travels in Northern Greece, by Colonel Leake. 4 vols. 1836.

Notes of a Visit to some parts of Haiti, in January and February, 1835, by the Rev. I. W. Hanna.

Narrative of a Residence in Koordistan and on the site of Ancient Nineveh, by C. J. Rich. 8vo.

A General Description of China and its Inhabitants, by I. F. Davis, Esq. 8vo.

Travels in Eastern Africa, descriptive of the Zoolus, with a Sketch of Natal, by N. Isaacs. 8vo.

Journey over-land to India, by Major Skinner. 2 vols. 8vo. 1836.

Travels in Greece and Turkey, by Major Sir Grenville Temple, Bart. 2 vols. 8vo. 1836.

Travels in Tunis, Tripoli, &c., by Major Sir Grenville Temple, Bart. 2 vols. 8vo. 1835.

Travels in Eastern Africa, by Capt. Gardiner, R.N. 1 vol. 8vo.

AMERICAN.

Three Years in the Pacific, including Notices of Brazil, Chili, Bolivia, and Peru, by an Officer of the United States Navy. 8vo. Philadelphia, 1834.

Reynold's Voyage round the World of the United States Frigate *Potomac*, commanded by Commodore Downes, in 1831-34. 8vo. New York, 1835.

History of Texas, by D. B. Edward, with a Map. 1 vol. 8vo. New York, 1836.

FRENCH.

Examen Critique de la Géographie du Nouveau Continent aux 15me et 16me siècles, par le Baron de Humboldt (in progress). 1836.

Dictionnaire Géographique des Provinces Belgiques, par M. Vander Maelen. 5 vols. 8vo. Bruxelles, 1835-36.

Monumens de l'Egypte et de la Nubie, par une Commission Spéciale. In 40 livraisons,—5 published.

Description de l'Egypte, ou Recueil des Observations et des Recherches qui ont été faites en Egypte pendant l'Expédition de l'Armée Française, 26 vols. with 12 vols. of Plates, 1820-36.

L'Egypte et la Turquie de 1829 à 1836, par Cadalvène et Breuvery. 4 vols. 8vo. (1st vol. published.)

Voyage dans l'Inde, par Victor Jacquemont. 4 vols. 4to. 1836. 10 livraisons published.

Antiquités Mexicaines ; relation des trois Expéditions du Capitaine Dupaix en 1805, 1806, et 1807, pour la recherche des Antiquités du Pays. 2 vols. fol. Paris, 1834-36.

Voyage Pittoresque et Archéologique dans le Mexique, par C. Nebel. In 12 livraisons—5 published.

Voyage au Mexique, par P. Charpenne. 2 vols. 8vo. 1836.

Voyage dans l'Amérique Méridionale, par D'Orbigny. In 7 vols. royal 4to. 12 livraisons published.

Histoire Naturelle des Iles Canaries, par MM. Barker, Webb, et Berthelot. To be completed in 3 vols. imperial 4to. with a large Atlas of Illustrations.

Etudes de Géographie Critique sur une partie de l'Afrique Septentrionale, par M. D'Avezac. 1 vol. 8vo. Paris, 1836.

La Russie, la Pologne, et la Finlande, par M. Schnitzler. 1 vol. 8vo. St. Petersburg, 1835.
Recherches sur l'Histoire de l'Afrique Septentrionale, connue sous le nom de Régence d'Alger, et sur l'Administration et la Colonisation de ce Pays à l'époque de la domination Romaine; par une Commission de l'Académie Royale des Inscriptions et Belles Lettres. Par M. Dureau de la Malle. 1 vol. 8vo. Paris, 1835.
Topographie de Constantinople, par M. Brayer, M.D. 2 vols. 8vo. Paris, 1835.
Physiographie, par E. Cortambert. 1 vol. 12mo. Paris, 1835.
Abrégé chronologique des Découvertes par Mer depuis l'an 2000 avant Jésus Christ, par Bajot. 1 vol. 8vo. Paris, 1835.
Voyage en Navarre en 1830-35, par J. Aug. Chaho. 8vo. Paris, 1836.
Mémoires de l'Académie Impériale des Sciences de Saint-Pétersbourg. 4to. 1835-36.
De l'Etude de la Géographie, par Guigniaut. 8vo. Paris, 1836.
Description of New Sweden (Pennsylvania), by Duponceau. Philadelphia, 1835.
Nouvelles Annales des Voyages, par Gide.
Annales Maritimes et Coloniales, par Bajot.
Observations des Marées faites de 1829 à 1833 sur les Côtes de France. 1836.
Mémoire sur les Courans de la Manche, par Monnier. 8vo. Paris, 1836.
Recherches Géographiques sur les Ruines de la Morée, par Puillon Boblaye. 4to. Paris, 1836.
Bibliothèque Universelle des Voyages, par Albert-Montémont. 42d et 43d livr.
Journal de la Marine, des Colonies, et Revue de Voyages, par De Montrol. 7 tom. 8vo.
Coup d'œil impartial sur l'état présent de l'Egypte, par Jomard. 8vo. Paris, 1836.
Souvenirs d'Espagne, par H. Cornille. 2 vols. 8vo.
Ritter, Géographie Générale, traduite par M. Buxet et Desor.

GERMAN.

Uber Historische Element in der Geographischen Wissenschaften, C. Ritter, 1835.
Zehn Jahre in Brazil, von Carl Seidler, 2 vols. 1835.
Die Erdkunde von Asien, von C. Ritter.
Reise um die Erde, durch Nord-Asien und die beiden Oceane, von A. Erman, 8vo. 1835.
Reise um die Erde in 1830-32, von Dr. F. J. F. Meyen, 2 vols. 4to. Berlin, 1834.
Reise in Chile, Peru, und auf dem Amazonenströme in 1827-32, von E. Poeppig, 2 vols. 4to. Leipzig, 1835.
Reise auf dem Caspischen Meere, und in dem Caucasus, in 1825-6, von E. Eichwald. Stuttgard, 1 vol. 8vo. 1835.
Atlas von Asia, von Dr. Heinrich Berghaus, 2te. Lieferung, No. 9 (Assand No. 16, die chinesiche küste), gr. in folio; Gotha, 1834.
Reise durch Deutschland, Italien und die Schweitz, im Jahre 1828, von C. G. Carus, 2 vols. 8vo. Leipzig, 1835.
Briefe aus Amerika besonders für diejenigen welche auszuwandern gedenken, von Fr. Dellman. 8vo. Wesel.
Reise nach Texas, von Detlef Dunt, 8vo. Bremen. 1834.

Die Insel Sicilien, von Joh. Caspar Fehr, 3 vols. gr. 8vo. St. Gallen und Bern.

Reise nach Wardoe bei Lappland und seine Beobachtungen des Venus-Durchganges in Jahre 1769, von P. Hell. Aus den aufgefundenen Tagebüchern geschöpft und mit Erläuterungen begleitet von Carl Ludwig Littrow. gr. 8vo. Wien, 1835.

Deutschland und seine Bewohner, von K. F. Hoffman. Stuttgard und Leipzig, 1835.

Europa und seine Bewohner, von K. F. Hoffman. Stuttgard und Leipzig, 1835.

Beschreibung der Erde, von W. Hoffmann. gr. 8vo. Stuttgard, 1834.

Handbuch für Reisende in Ungarn, von Rud. von Jauny, vermehrte von Adolf Schmioll. Wien, 1835.

Malerische Reise nach Orsowa, von S. von Ludvigh. 2 vols. 8vo. Hildburghausen, 1835.

Beschreibung des Schweitzerlandes Aarau, 1827-1835, von Pfarrer Marcus Lutz.

Handbuch der Militair Geographie von Europa, von Freyherr Von Malchus. gr. 8vo. Parts I. to IV. Heidelberg, 1834.

Manuel des Voyageurs, von Engelmann und Reichard. 4me édition, 1835. Frankfort sur Main.

Malerische Reise durch die Sächsische Schweiz, von G. A. Müller. Berlin, 1834.

Reise nach dem Nördlichen Amerika in den Jahren, 1822 bis 1824, mit 1 Karte, von Paul Wilhelm Herzog von Würtemberg. 8vo. Stuttgard und Tübingen, 1835.

Reise in Ungarn und Italien, von Hauptmann von Pirch. gr. 8vo. Berlin, 1835.

Malerische Reise durch Lombardei, von Pezolt. Carlsruhe, 1834-5.

Militär Geographie, von Ritter von Rudtorffer. 1 vol. folio. Prague.

Zehn Jahre in Brazilien, von Carl Seidler. 1 vol. gr. 12mo. Quedlinburg.

Vergliechende Orographische Tabellen, von Ritter F. von Strantz. gr. 8vo. Breslau, 1835.

Der Preussische Staat in allen seinen Bezichungen. Parts I. to III. Berlin, 1835.

Allgemeines Verzeichniss der Bücher im Frankfort und Leipzer Ostermesse des 1835. gr. 8vo. Leipzig.

Reise durch Tyrol nach dem südlichen Spanien, von Jos. Watll, M.D. gr. 12mo. Passau.

Wanderungen im Norden von England, von J. Ed. Stahlschmidt. gr. 4to. London, 1834.

Das Netz der Allgemeinen Karten des Eratosthenes und Ptolemæus mit 1 Tafel, von Friedr. Wilberg. gr. 4to. Essen, 1835.

Bessarabien Bemerkungen bei Gelegenheit eines mehrjährigen Aufenthaltes in diesem Lande, von Dr. J. H. Zucker. gr. 8vo. Frankfurt am Main, 1834.

Die neuesten Kunst-strassen über die Alpen Beschrieben, mit 13 Tafeln, von Jos. Baumgartner. gr. 8vo. Wien, 1834.

Atlas von Asia, 3te Liefer. (Syrien, Arabien, Chinesischer Meer) von Professor Dr. Heinrich Berghaus. gr. 4to.

Trigonometrisch bestimmte, des Herzogthums Salzburg, von Berghöhen. gr. 16mo. Salzberg.

Das Landvolk in Grossherzogthum Mecklenburg-Schwerin, von Dr. C. F. Bollbrügge. gr. 8vo. Güstrow, 1835.

Reise von London über Paris und einen Theil der Schweiz, von Adalbert von Bornstedt. gr. 12mo. Berlin, 1835.

Das Oppaland oder Geschichte des Herzogthums Troppau, von Professor Faustin Ems. gr. 8vo. Wien, 1835.
Statistik von Schweden übersezt vom Hofprediger A. G. F. Freese (mit 1 charte), von Ritter Carl af Forsell. gr. 8vo. Lubeck, 1835.
Reise durch Italien vom Jahre 1828 bis 1830, von J. B. Hegemann. 8vo. Munster.
Gemählde der Slavonischen Militairgränze, von Spiridon Jowitsch. gr. 8vo. Wien, 1835.
Londres et ses Environs, von Comte Fedor de Karaczay. 8vo. Vienne.
Statistisch-Topographische Schilderung von Rheinbaiern, von G. Fr. Kolb. 8vo. Speier.
Tyrol, 1833-4, von Aug. Lewald. 2 vols. 8vo. Munchen.
Münz-Cabinet des Reisenden oder Abbildungen von currenten Münzen. gr. 8vo. Frankfort, 1835. Parts I. to III.
Darstellung des Hegyallyaer Weingebirgs und der Bereitungsart des Tokayer Ausbruches, von Jos. Némety. gr. 12mo. Wien.
Die Volkszählung im Altona im Jahre 1834, von Ritter Niemann. gr. 8vo. Altona, 1835.
Statistik von Hessem-Cassel, von Inspektor Kaspar Nöding. 8vo. Kassel, 1835.
Norder Reise durch Deutschland, Frankreich, und Italien. 2 vols. 8vo. Hamburg, 1836.
Lehrbuch der Geographie, von Professor Karl von Raumer. gr. 8vo. Leipzig.
Reise nach Paraguay in den Jahren 1818 bis 1826, von D. J. R. Rengger. gr. 8vo. Aarau, 1835.
Die Erdkunde von Asien, Iste Abtheilung, von Professor Dr. Carl Ritter. gr. 8vo. Berlin.
Geographisch Statistisches Handlexikon aller Länder, von W. E. A. von Schlieben. Parts V. to VII. Weimar, 1835.
Trachten und Gebräuche der Neu-Griechen, von O. M. Baron von Stackelberg. Part I. gr. folio. Berlin, 1835.
Statistik von Schleswig und Holstein. 8vo. Schleswig.
Skizzen aus Russland, der Türkei und Griechenland in den Jahren 1833-4, von Legationsrath Tietz. 2 vols. 8vo. Coburg, 1836.
Ueber die Bewegung der Bevölkerung, Ein Beitrag zur Biostatistik, von Titus Tobler, M.D. gr. 8vo. St. Gallen.
Statistik des Königreiches Böhmen, von Joh. Wanisch. gr. 8vo. Prag. 1836.
Bruchstücke zur Geschichte der Stadt Aurich, von Wiarda. gr. 8vo. Emden, 1834.
Die Markgrafschaft Mährer Topographisch geschildert, von Professor Gregor Wolney. 1 vol. gr. 8vo. Brünn.
Reise von Bahia nach Afrika, von C. H. von Zutphen aus Bahia. gr. 12mo. Düsseldorf.

GERMAN GEOGRAPHICAL PERIODICALS.

Anallkten für Erd-und Himmelskunde, herausgegeben von Prof. Dr. Fr. v. P. Gruithuisen. gr. 8vo. München.
Annalen der Erd und Staatenkunde (in continuation of Hertha), von D. Heinr. Berghaus. 11th and 12th vols. gr. 8vo.
Neue Bibliothek der Reisebeschreibungen. 64th and 65th vols. gr. 8vo. Weimar, 1835. (Reise nach Bokhare von Lieut. Alex. Burnes.)
Bibliothek der neuesten Weltkunde, von H. Malten.
Eisenbahn Journal (Rail-road Journal), von Fr. List. gr. 8vo. Altona, 1835.

Würtembergische Jahrbücher für vaterländische Geschichte Geographie und Topographie von J. G. D. Memminger. Stuttgart und Tübingen. 8vo.
Dorpater für Litteratur, Statistik und Kunst, besonders Russlands herausgegeben, von Blum, u.m.a. Parts VI. and VII. 1836.
Journal für die neuesten Land und Seereisen, von Dr. G. G. Friedenberg. gr. 8vo. Berlin.
Kritischer Wegweiser im Gebiete der Lankarten-Kunde. Vols. 6 and 7, gr. 8vo. Berlin, 1834-5.
Taschenbibliothek der Reisen, von Bibliothekar Joachim Heinrich Jäck. 86 vols. Spanien und Portugal. Berlin.
Taschenbuch für Reisende durch die Schweiz, Tyrol, u.s.w., von Dr. Aloys Schreiber. Heidelburg u. Frankfurt.
Steiermärkische Zeitschrift. 2 vols. Grätz, 1834-5.
Yahrbücher der Litteratur. Wien.

DUTCH.

Nippon Archief voor de beschrijving van Japan, by Ph. von Siebold; Leyden, 1832-36. 6 parts published.
Reizen in den Molukschen Archipel, naar Mekassen, euz in let gevolz van der Gouverneur-General von Nederlands, Indie, 1824; by J. Oliver. Rotterdam, 1835.
J. Hacfkens oud Consul-General der Nederlands am Central America mit een Geschiedkundig, Aardrijk en Statistik oogpunt beshowd; Leyden.
Herinneringen uit Japan, von H. Doeff. 4to. Haarlem, 1835.

ITALIAN.

Monumenti dell' Egitto e della Nubia, by Professor Rosellini. Pisa.
Specchio Geografico e Statistico di Marocco, by Count Gräberg de Hemsö. 1 vol. 8vo. with Maps. Genoa, 1835.
Diccionario Geografico Statistico di Toscana, by Repetti, Florence. 11 parts published.
Compendio Geografico della Dalmazia con un' appendice sul Montenero, by C. Petter. 1 vol. 12mo.
Statistico della Provincia di Saluzzo, by Vasalli Eandi. 4 vols. 4to. with Maps and Illustrations.
Viaggio nella Liguria Maritima, Bertolotti. 3 vols. 8vo. Torino.
Lettere del Conte Carlo Vidua. 3 vols. 8vo.
Memorie dell' Accademia di Torino.

SPANISH.

Cinco meses en los Estados Unidos de la America del Norte en el año 1835, por Ramon de la Sagra. 8vo. 1836.

PORTUGUESE.

Memoria Estatistica sobre os Dominios Portuguezes na Africa Oriental, por Sebastiaõ Xavier Botelho. 1 vol. 8vo., Lisbon, 1836.
Memoria sobre as Verdadeiras Epocas de nossos Descobrimentos no Oceano Atlantico, por J. J. da Costa de Macedo. 4to. Lisbon, 1834-5.

MAPS AND CHARTS.

The Ordnance Survey of Great Britain, scale 1 inch to a mile, 69 sheets published.
Ordnance Survey of Ireland, scale 6 inches to a mile, publishing.
"The London Atlas" of Universal Geography, in 50 sheets, by John Arrowsmith; London, 1835.
Map of the Cape Colony, from the most recent documents in the Colonial Office, by John Arrowsmith; scale 2 inches to a degree. London, Nov. 1835.
A newly-constructed Map of India, in 6 sheets. Parbury and Allen, 1836.
Chart of the Red Sea, 1830, 1834, scale 6 inches to a degree, by Captains Moresby and Carless, I. N.; London, 1836.
Topographical Map of the Province of Buenos Ayres, from the latest information, by John Arrowsmith, in 2 sheets; London, 1836.
Map of the Eastern Frontier of the Colony of the Cape of Good Hope, by John C. Chase, Esq.; scale 5½ inches to a degree. London, Oct. 1836.
Map of Texas, compiled by Austin, published by H. Tanner, Philadelphia.

Hydrographic Office.

North America; East Coast, from Moutock Point to Cape Hatteras, 1836.
Banks of Newfoundland, 1836.
Arctic America, containing Barrow Straits, Prince Regent Inlet, Boothia Gulf, &c., with Plans of Ports, 1836.
West Coast of Africa, from Cape Roxo to Isles de Los, by Captain E. Belcher and Lieutenant Arlett, 1826, 1834; London, 1836.
New Zealand (North Isle); Shouraka Gulf and the Mouth of the River Thames, from the Surveys of Cook, Downie, Durville, and Mr. J. Sadler; London, 1836.
Ditto „ Wangeroa Bay, surveyed by Lieut. T. Woore and Mr. T. Cudlip, R.N., 1834; London, 1836.
Ditto „ (Cook's Straits), Current Basin, from M. D'Urville's Atlas, 1827; London, 1836.
Ditto „ (South Isle, Cook's Strait) Port Gore, Lieut. T. Woore, R.N., 1834: London, 1836.
Ditto „ (North Isle, Shouraka Gulf), Kiahow Harbour, F. A. Cudlip, R.N., 1834.
Ditto „ (D'Urville Isle, Cook's Strait), Port Hardy, Lieut. T. Woore, R.N., 1834.
Jamaica, (North-west end), St. Lucia Harbour, Lieut. B. Baynton, R.N., 1834.
Central America, West Coast of Nicaragua, Guatemala, &c., by Don Felipe Bauza.
West Coast of Mexico, &c., Don Felipe Bauza, 1794.
Demerara River, by Capt. Richard Owen, 1833.
The Anchorage off Portendick on the Sahara Coast of West Africa, by Lieut. Quin, 1834.
Lough Neagh, Ireland, Lieut. T. Graves.
The East Coast of England from the Farn Islands to Berwick; Berwick Harbour; Holy Island Harbour; by Capt. E. J. Johnson, R.N., 1833.
Ports in the Straits of Magalhaens, by Capt. King, 1829.
West Coast of South America, from the Gulf of Trinidad to the Gulf of Peñas, by Capt. P. King, R.N., 1829.

Dépôt de la Guerre.

Carte Topographique de la France, scale $\frac{1}{80.000}$, in 258 sheets; 36 published.
Carte Topographique de la Guienne, par M. Bellayme, scale $\frac{1}{48.000}$, in 54 sheets; 47 published.

Dépôt de la Marine.

Plan des îles du Salut, 1834.
Carte des attérages d'Oran et d'Arzen, 1833.
Carte des attérages de Bône, 1833.
Carte de la côte Septentrionale d'Afrique, entre Alger et l'île de la Galite, 1831, 1832, et 1833.
Plan de la rade de Cancale et de ses environs, 1829.
Partie Occidentale des îles Chausey et Plateau des Minquiers, 1831-32.
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Plan du mouillage des Ehbiens et du Port de St. Briac, 1829.
Plan du Port de Granville et de ses environs, 1829-31.
Plan du Port de St. Mâlo, 1829.

MAPS.

Carte du Dar Four, par Ed. di Cadalvène. Paris, 1835.
Carte du théâtre des opérations Militaires près d'Oran, par N. Noirot. Paris, 1835.
Carte de la Morée et des Cyclades, une feuille, par E. Puillon Boblaye. 1836.
Atlas physique, politique, et historique de la France, par Denaix.
Atlas von Schlesien, 7th to 16th No., gr. 4to., Leipzig.
Carta Topografica del Regno Lombardo-Veneto, construtta a Milano nell' Instituto Geografico Militare. Publicata nell' anno 1833, Part I., 24 sheets, with one index sheet, 4to.
Vergleichende Darstellung der Vedentendsten Höhen der Erde, von E. Grasmüller, folio. München, 1834.
Düsseldorf Topographisch, von F. W. Grube, in 13 sheets, lithog., gr. folio, Crafeld.
Topographische Karte von Hannover und Braunschwig, von A. Papen, C. Fischer, und H. Wild, in 67 sheets, Hamburg und Altona.
Karte des Königreichs Illyrien reducirt im Jahre 1834, von dem K. K. Oester-

reich, General-Quartier-meister stabe 1st Abtheilung, gr. folio, Leipzig, Weizel.

Karte von Kurland, von Ritter C. Neumann, 6 sheets. Milan, 1833.

Das Königreich Sachsen, von Ritter C. Neumann, 1835, royal folio.

Heilquellen-Karte, von C. F. Weiland, imperial folio. Weimar, 1835.

General Karte vom Europäischen Russland, von C. F. Weiland, in 4 sheets, imperial folio. Weimar.

Karte vom Königreich Würtemberg, von J. E. Wœrl, in 12 sheets.

Karte der Schweiz, von J. E. Wœrl, in 20 sheets.

Karte von der Tyrol, von J. E. Wœrl, in 20 sheets.

Reise Karte von Böhmen, von Jos. Zakowsky, royal folio. Wien.

Karte des Königreich Sachsen. Sheets 1, 5, 9, 19, imperial folio. Dresden.

Die Lanschaften Norder und Süder Ditmarschen, von Capitain E. I. F. Christensen, imperial folio. Heide, 1833.

Geognostische Karte des Landes Zwischen Magdeburg und Cassel, von F. W. Klieiver, folio. Berlin, 1835.

Atlas Historique de la Pologne, von Comte Stanislas Plater. Posen, 1827.

Die Insel Rügen, royal folio. München, 1835.

Das Kœnigreich Sachsen, von W. E. A. von Schlieben, imperial folio, Leipzig.

Karte von des Grossherzogthums Posen, von A. Stubba, 6 lithog. sheets, in royal folio.

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